THE NAVY'S ENERGY & ENVIRONMENTAL MAGAZINE CONTROLLED TO THE Spring 2011

Spotlight on the

WORLD WILDLIFE FUND

Bill Eichbaum, Vice President of Arctic and Marine Policy, Talks About the Challenges Facing the Arctic & Other Ecologically Significant Places

Assessing the Extent of Plastic Debris in the Ocean
NASA & the Navy Developing the Fuel of the Future
NAVFAC Headquarters Announces 2010 Drum-E Award Winners





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Mr. Eichbaum spoke about the World Wildlife Fund's (WWF) top priorities, past interactions with the Navy and Department of Defense, and opportunities for future collaborations between WWF and the Navy.

Spotlight on the World Wildlife Fund

Bill Eichbaum, Vice President of Arctic and Marine Policy, Talks About the Challenges Facing the Arctic & Other Ecologically Significant Places

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Steaming Toward Energy Culture Change

WELCOME TO THE spring 2011 issue of Currents. As you browse these pages and take note of the many new and innovative projects the Navy is undertaking in the energy and environmental arena, I ask you to ponder the larger picture of why the Navy invests dollars and manpower in these areas. While few would dispute that "greener" technologies and processes, more efficient use of our natural resources, and reduced carbon emissions are laudable goals in and of themselves, fiscal realities dictate that the Navy must also keep foremost an ultimate goal of maintaining or increasing our combat capability afloat and ashore. If we can also do this by "greening" our footprint, we create a win-win for national security and environmental security. This is most certainly true today as the Navy pursues innovative technological and behavioral energy initiatives that promote energy conservation and efficiency along with sustainable alternatives to petroleum, all of which result in a decrease in greenhouse gas emissions. This is not a first for the Navy, however. Over the past few decades, there have been other cases where Navy was able to find win-wins for the service as well as the Nation.

improving our waste management and recycling efforts ashore and afloat.

These environmental efforts have helped make it possible for the Navy to continue carrying out our mission. If we ignore environ-



mental laws and trends, our ability to operate ships and bases in the strategic locations our mission requires could be severely restricted by regulatory agencies and also impacted by a loss of trust by the American public. In this way, effective environmental stewardship is needed to maintain our combat capability.

Like much of the nation, the Navy underwent an "environmental culture change" as the new awareness of the 1970s took hold. While our understanding of how we affect the environment continues to evolve as new scientific findings

Effective environmental stewardship is needed to maintain our combat capability.

Looking back to the 1970s, a grassroots environmental movement and series of tragic, sensational incidents (e.g., Love Canal, Cuyahoga River fire) raised awareness of the effects that manmade contaminants can have upon human health and the environment. Regulatory agencies such as the U.S. Environmental Protection Agency and the National Oceanic and Atmospheric Administration were created, and new environmental legislation was enacted to protect the land, water, air, and the organisms (including humans) that depend on that environment to survive and thrive. As a result, the Navy, along with the other military services and private organizations, began developing policies to comply with those laws. We have since begun a host of initiatives to minimize our impacts, including cleaning up past chemical disposal sites and munitions, preserving threatened and endangered species on and around our bases, reducing air pollution and carbon emissions, minimizing our effects on marine life while training, and

and technological innovations come to light, we made changes 40 to 50 years ago that have long-term effect on our approach to environmental stewardship today. Sailors and their leadership on ships in 2011 understand that their daily environmental stewardship decisions and behaviors can impact both combat capability and the natural environment.

Changes in the Navy's approach to energy have been slower to take hold. While the Organization of Petroleum Exporting Countries (OPEC) oil embargo of 1973 pushed the Navy to pursue shipboard fuel efficiency measures at the time, those initiatives did not lead to consistent, long-term changes in Navy energy use. Not until 2004, when a sudden global increase in energy demand (largely from newly developed and industrialized nations) caused oil prices to skyrocket within four years, did the Navy fully recognize the spectrum of strategic vulnerabilities that petroleum dependence can create. Once that energy shock occurred, we began working on a solution set to

deal with the issue of increasing global demand for energy and the ability of the oil industry to respond.

Among the Navy's immediate energy priorities are reducing energy consumption through efficiencies, driven by technological advancements and behavioral change, and adopting new alternative sources of energy for tactical and shore applications.

Greater energy efficiency directly translates into combat capability in a wide range of scenarios. On the ground in Afghanistan, greater fuel efficiency means that our tactical equipment on the front lines can run longer and/or farther on a gallon of fuel and that fewer convoys will be needed to resupply fuel. That also means fewer convoys will be

aircraft (the "Green Hornet," as featured in the winter 2011 issue of *Currents*), an MH-60S helicopter, a riverine command boat, and a gas turbine engine used to generate electricity aboard destroyers and cruisers have shown that advanced biofuels can be indistinguishable in performance to both the operator and the weapon system. Together with other alternative energy sources (such as wind, solar, geothermal, and ocean thermal energy conversion where feasible), these technologies are an initial step toward the Secretary of the Navy's vision of a 'Great Green Fleet,' creating an off-ramp from petroleum and helping to insulate our operating forces and critical infrastructure from dependence on a volatile and ultimately finite fuel supply.

Greater energy efficiency directly translates into combat capability in a wide range of scenarios.

exposed to potential attacks by improvised explosive devices (IED). On the open ocean, shipboard energy efficiency means more time on-station performing mission functions and less time spent refueling at sea. On the shore side, energy efficiency helps insulate critical infrastructure from the fragility of the commercial power grid. Examples of efficiency initiatives include reducing the fuel consumption of portable generators and environmental control (HVAC) units; the shipboard Incentivized Energy Conservation Program (i-ENCON), which results in increased steaming hours at no additional cost by managing fuel consumption and transit speeds; and advanced electric metering for shore facilities, which tells base commanders which buildings have the highest energy use and the greatest potential for improved efficiency.

At its most basic level, combat capability requires weapon systems that are fueled and ready to respond. The Navy recognizes that ships (apart from nuclear-powered carriers) and aircraft will likely require energy-dense liquid fuel to operate for the foreseeable future. Because more than half of the fuel the Navy uses is petroleum, we will continue to face supply issues, increased cost, and competition over this finite resource. To reduce this vulnerability, we are testing and validating alternative fuels that can serve as drop-in replacements for petroleum-based fuels. These alternative fuels require no engine modifications and can be mixed in the same tank as petroleum. Tests to date using 50/50 blends of biofuel and petroleum on an F/A-18

As promising as these innovations may be for optimizing energy use in support of the Navy's mission, technology is not a solution by itself. Only through a combination of technology and changes in personal behavior will the full potential for increasing combat capability through energy be achieved. Sailors must reinvent their concept of energy and adopt an energy-frugal mindset, considering fuel as valuable to their ship, plane or tactical vehicle as ammunition is to a weapon system. This is not a new concept. As Admiral Ernest King said in WWII, "Oil is Ammunition." Once a Navy-wide energy culture change occurs, profound change can take place on a much broader scale. Many of these energy initiatives, when fully implemented, will also minimize greenhouse gas emissions and other forms of air pollution, as well as reduce the potential for environmental catastrophes such as oil spills.

We must look far beyond annual and five-year budget cycles and learn how to sustain our combat capability for decades, if not a half century. Taken as a whole, that long view can ultimately allow the Navy's energy and environmental programs—while driven by our need for combat capability—help our nation and our world become more sustainable. As residents of Planet A (otherwise known as Earth), with no Planet B anytime soon, we should view that as a highly worthwhile goal. $\mathring{\downarrow}$

Rear Admiral Philip H. Cullom Director, Energy and Environmental Readiness





Bill Eichbaum, Vice President of Arctic and Marine Policy, Talks About the Challenges Facing the Arctic & Other Ecologically Significant Places

Eichbaum, Vice President of Arctic and Marine Policy for the World Wildlife Fund (WWF). On 19 October 2010, Ken Hess from the public affairs staff at the Chief of Naval Operations Energy and Environmental Readiness Division (N45) and Bruce McCaffrey, managing editor of *Currents* magazine, conducted this interview as one in a series of interviews with representatives from environmental non-governmental organiza-



tions (NGO). Mr. Eichbaum spoke about WWF's top priorities, past interactions with the Navy and Department of Defense (DoD), and opportunities for future collaborations between WWF and the Navy.



We seek to be the voice for those who have no voice.

CURRENTS: How long have you worked for WWF and what are your present responsibilities?

BILL EICHBAUM: I've been here twenty years. When I came here, I really came for only one purpose, which was to help WWF create a marine

conservation program. After I'd been here three weeks, I became the Vice President for Environmental Quality, when that person left. I ended up assuming an international policy agenda at WWF. In the twenty years since then, I have run each component of our conservation program, with the exception of our species program. I helped to start our energy program back in the early 1990s. We also created a marine conservation program. I was instrumental in getting

a major presence established in Russia in the 1990s and was part of our efforts to focus our work in the late 1990s and early 2000s on a smaller number of ecologically significant places around the world.

I am the Vice President for Arctic and Marine Policy, which means I have specific responsibility for our policy agenda in the Arctic, and broader obligations across marine environments. On an acting

basis, I am also the Vice President for Government Relations.

Before joining WWF, I spent 20 years as a government regulator at the States of Maryland, Pennsylvania, and Massachusetts and at federal levels in the environmental conservation area.



WWF ONLINE

WWF'S WEB SITE (www.worldwildlife.org) serves as both an informative tool for activists and an educational resource for students—painting a vast overview of the planet and all its inhabitants and species.

WWF's essential message is a warning about climate change and threats to our natural habitats. Web surfers can learn about nineteen priority destinations identified by WWF where climate and resources are at risk. From the tropical rain forests of the Amazon to the remarkable wildlife of the Yangtze region, WWF studies the diverse aspects of nature and what steps are necessary to preserve some of the Earth's most glorious—and most threatened—environmental gems.

The 2010 Living Planet Report, available on the WWF web site, is a comprehensive global study of biodiversity, ecosystems, and consumption of natural resources. Did you know that we currently consume the equivalent of 1.5 planets to support human activities? According to Living Planet, current trends project that by 2030 we will need the capacity of two planets to meet natural resource consumption needs.

The WWF's Conservation Action Network offers insight and opportunity to help support efforts to protect endangered



species. Currently, the web site identifies tigers and blue whales as worthy of global attention.

Government relations and policy review are also accessible via the WWF home page. The organization is consistently active in development of national and global policies that reflect the WWF mission. A section called "WWF and the New Administration" outlines how WWF works with the White House to convey policy recommendations and maintain progress on important environmental initiatives.

Based on my work in Maryland and working closely with the federal government, I was involved in amending the Clean Water Act to create the U.S. Environmental Protection Agency's National Estuary Program.

CURRENTS: Tell us a little bit about the primary mission of WWF.

Ei(HBAUM: Our basic mission is the conservation of life on earth. We seek to be the voice for those who have no voice. We carry that out by operating in a small number of places where the richness and biodiversity is unique or extensive... the Amazon, the Arctic, the Coral Triangle in Southeast Asia are key places. But we also work on a global basis to affect those global forces that will be detrimental for the survival of life in those places. We work on forestry practices, climate change, and fisheries from a global perspective. We work to transform markets particularly for commodity products. We also do work specifically on speciesrelated conservation activities. We have identified flagship species, which are the critical ones that warrant our immediate and urgent attention. You might call our flagship species keystone species. For example, in the Arctic, working on the polar bear is critical. Right now,

we are sponsoring a global campaign to reverse the decline of tigers in the wild. We participated in a major summit in St. Petersburg in November 2010 to call global attention to the decline of tigers and bring the resources and political commitment on tiger conservation.

The species work is very important, but the place-based work is really at scale. It's large places and our work on global threats and our history of threatened species that are being most successful. We weren't being successful at reversing the overall



WWF'S *Save the tigers* campaign

THE CHINESE ZODIAK calendar identifies 2010 as the Year of the Tiger, and WWF seized the opportunity to rally support for one of the earth's most endangered species. One-third of tiger subspecies have already been tagged as extinct, and according to WWF, as few as 3200 tigers remain in the wild—the lowest such figure in recorded history.

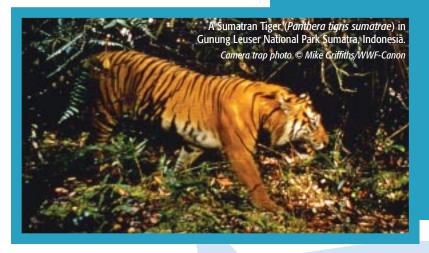
With a combination of celebrity, social media, and environmental consciousness, WWF launched the Save the Tigers initiative to cultivate awareness and gather support for the protection of six remaining tiger subspecies and their habitats. Tigers are routinely threatened by unlawful killing to support black market sales of animal skin, bones, and organs. Their natural surroundings are subject to illegal logging and bulldozing.

An estimated 12,000 Facebook users are among those lending support to the cause, which also boasts high profile Hollywood support from actors Leonardo DiCaprio and Dick Van Dyke.

Save the Tigers reached a critical impasse in November 2010 as environmental and global leaders met in St. Petersburg, Russia for the Tiger Summit, aimed at

> addressing the fate of this endangered species. An online petition called for the U.S. Government to support tiger conservation and Secretary of State Hilary Clinton to attend the Summit (Undersecretary Maria Otero actually led the U.S. Delegation). According to the petition, "U.S. involvement in the Tiger Summit will be central to its success and to achieving the required outcome for the survival and recovery of wild tiger populations."

WWF aims to double the number of tigers in the wild by the year 2022, when the 12-year Chinese calendar returns to the Year of the Tiger.





trend of the loss of diversity and habitat. So we felt we needed to operate at a larger scale. The important thing about working at a larger scale is that you get much more involved in the lives of people. You

We are failing significantly as a global society to grapple with reducing greenhouse gas concentrations in the atmosphere.

are no longer just protecting the environment. You are trying to ensure that as you protect wildlife habitat that, in fact, the people who are dependent upon those habitats actually get benefits from them.

CURRENTS: What's a good example of how local people might benefit from a species or habitat?

EiCHBAUM: A good example, and one that involved the Navy, is in Mozambique.

COMMON INTERESTS: THE U.S. NAVY & MARINHA DE GUERRA

IN A PROJECT called *Support to the* Marinha de Guerra (Mozambican Navy) for Improved Security along Coasts and in Conservation Areas, the U.S. Navy has furnished more than a dozen inshore patrol vessels for all of Mozambique. In tandem with the equipment, Navy officials have trained more than 100 members of the Mozambiguan Navy in the operation and maintenance of small boat use. The project, which began in 2002, focuses on regions of high biodiversity and areas of conflict, including security measures to combat drug and human trafficking.

"WWF assisted the Navy to choose and prioritize these areas," according to WWF/USA's Caroline Simmonds, "which are also areas where WWF is working."



The areas selected include Ouirimbas National Park, the proposed Primeiras and **Segundas Marine Reserve** area, the proposed Lake Niassa Reserve, and the Vamizi area of northern Mozambiaue.

"Since 2007," says Simmonds, "the U.S. Navy has also invited WWF staff to three seminars and the Mozambican Navy to one additional seminar for defining priorities for coastal security in Africa."

Security ranks as a top priority in the region, where the drug trade-and even the trade of humans—operates across oceans. According to a recent Reuters report, Mozambique is steadfastly becoming one of Africa's leading drug trade ports, moving significant amounts of hashish, cannabis, cocaine, and heroin to European countries. As a result, the U.S. Coast Guard also participated in training of the Mozambiquan Navy, emphasizing security, patrol, and interception of other inshore vessels.



"Early this year," Simmonds adds, "the U.S. Navy developed six radar/observation posts that pick up transponders on all commercial vessels-they can see ships that don't have transponders. This is crucial for scaling up coastal security enforcement."

The United States continues to lend its support to the security of Africa's waterfront, emphasizing the security of the seas as a major component of overall global security. To learn more about efforts in Africa, including the concept of Africa Partnership Station, visit www.naveur-navaf.navy.mil/apshome.html. We have been working for over ten years with a large but not exclusive focus on coastal issues. In that process, we have set up with the Mozambique government a series of special management areas and highly protected areas.

As an example, one of those areas is called Quirimbus in the northern part of the country. It's got a big marine component, a big terrestrial component, and there are about 60,000 people that live inside of this 7,000 square kilometers special management area. One of the management strategies there is to have marine protected areas. The siting and location of those areas was very much done on a consultative basis with the local people, and the idea was to protect critical areas for the overall productivity of the fisheries resource, and for biological diversity.

The result is that there are overall more fish in the region, and the local people, in the areas where they do fish, have an ability to get a better and larger harvest. The U.S. Navy came into the picture when we found that the Mozambican Navy had virtually no boats. We worked with the U.S. Navy to see about getting boats and equipment to the Mozambique Navy so they could begin to do enforcement of zoning schemes within the protected areas. That was done in early 2000, and has been very effective.

CURRENTS: What are your main challenges today, and those that might exist five years from now?

EiCHBAUM: Our overarching challenge is climate change which has a lot of dimensions that are of particular interest to the Navy. First of all, we are failing significantly as a global society to grapple with reducing greenhouse gas concentrations in the atmosphere. That failure will have, in this century, significant ramifications on our society.

Some of these dimensions relate to the marine environment. It's not just global warming, but also ocean acidification. As carbon increases and is absorbed into the ocean, that produces chemical changes that ultimately increase the acidity of the ocean. This acidification affects the viability of organisms in the ocean that depend upon calcifying processes to build their skeletons.

Basic building blocks of important fisheries could be affected, such as terrapods in the Arctic, that could affect



two of the four richest fisheries in the world. Coral reef systems could be affected.

I look at climate change issues through the lens of the Arctic, which is heating up about twice as fast as the average across the globe. Summer sea ice could possibly disappear within this decade. And winter ice, or multi-year ice, is less extensive and different in characteristic than it used to be. It is disappearing also.

So what does this mean? There are feedback loops globally from that process. Warming in the Arctic contributes to global atmospheric warming, so as the ice disappears you go from white to black surfaces. Black absorbs heat and does not reflect it. That heat goes into the oceans and is dissipated back, contributing to atmospheric warming. Because of changes in a variety of factors, you also begin to get changes in ocean currents that are driven out of the Arctic, and those changes can have profound impact on the productivity of not just the Arctic, but on all of the world's oceans in ways that we don't yet understand.

Changes in the Arctic are interesting because they will indicate that there is a lot more going on in the Arctic. It has already become a place for enhanced domain awareness.



Changes in ocean currents that are driven out of the Arctic can have profound impact on the productivity of the world's oceans.

It's interesting to watch the public debate about the Arctic because there are the journalists who are hyping the rush to the Arctic for resources. And then you have governments who say, "No no no, that's all an orderly process. The Law of the Sea will determine how Arctic resources are divvied up." This is true. But the fact that people and governments are up there occupying, utilizing, and exporting doesn't mean that there won't be domain awareness. Part of this utilization will be new sea routes that reduce existing routes between critical places by as much as 25 to 30 percent, such as between Asia and

Europe. Sea routes have always been something that nations assured were militarily accessible and protected. While I think it unlikely that there will be outright conflict, I think there will be greater military presence. Considerations about presence by the United States in the area will be of growing importance.

From my perspective, seeing this potential for development, change, and cross-boundary issues, it will be of growing importance that the states of the Arctic vigorously join together to have a shared system for collaborative management of the Arctic—jointly thinking through problems while they

act within their national contexts to implement solutions to those problems.

At WWF, we argue for a much stronger system of collaborative governance among the Arctic nations than now exists.

CURRENTS: What is the WWF doing to promote this collaboration?

EiCHBAUM: There is currently something called the Arctic Council which was created by the eight Arctic states in the mid-1990s. It's a think tank and not a decision-making body. It sponsors scientific studies and makes recommendations and issues guidelines based on that science. But

THE BASICS ABOUT THE LAW OF THE SEA TREATY

THE LAW OF the Sea Treaty, formally known as the Third United Nations Convention on the Law of the Sea (UNCLOS III), was finalized in 1982. Its purpose is to establish a comprehensive set of rules governing the oceans and to replace previous U.N. Conventions on the Law of the Sea, one in 1958 (UNCLOS I) and another in 1960 (UNCLOS II), that were believed to be inadequate.

Negotiated in the 1970s, the treaty was heavily influenced by the "New International Economic Order," a set of economic principles first formally advanced at the United Nations Conference on Trade and Development. That agenda called for "fairer" terms of trade and development financing for the so-called under-developed and developing nations.

Another way the New International Economic Order has been described is "redistributionist."

The Law of the Sea Treaty calls for technology transfers and wealth transfers from developed to undeveloped nations. It also requires parties to the treaty to adopt regulations and laws to control pollution of the marine environment. Such provisions were among the reasons President Ronald Reagan rejected the treaty in 1982.

In addition to the economic provisions, the treaty also establishes specific jurisdictional limits on the ocean area that countries may claim, including a 12-mile territorial sea limit and a 200-mile exclusive economic zone limit.

Some proponents of the treaty believe that it will establish a system of property rights for mineral extraction in deep sea beds, making the investment in such ventures more attractive.

(Source: The United Nations' Law of the Sea Treaty web site at www.unlawoftheseatreaty.org.)

those recommendations and guidelines are not binding or mandatory, and largely not followed by governments.

There's also an agreement on search and rescue now being negotiated among the states.

The WWF commissioned several academic scholars in Europe to look at the governance issues in the Arctic. They wrote several technical papers for us, published in the spring of 2010. Ultimately, the paper recommends a simple framework convention, legally binding, on the Arctic states and negotiated by those states to provide a general set of principles where they would agree to work together for the good of the Arctic.



Actual implementation would be different from topic area to topic area, but it would flow from a collaborative agreement and overarching understanding of the science and the threats to the Arctic.

WWF'S MARINE ARCTIC REPORT

IN 2010, WWF commissioned and published a report on International Governance and Regulation of the Marine Arctic, a region described by WWF as the "first and worst" area affected by climate change. The document—compiled by University of Lapland Professor Timo Koivurova and Researcher Erik J. Molenaar of the Netherlands Institute for the Law of the Seas—supports the mission of WWF's International Arctic Programme to prioritize the global impact of deteriorating Arctic climate conditions.

"In our proposal, we try to show the way to conduct ecosystem-based management in all of the Arctic marine area, very much building on a compromise between the Arctic and non-Arctic states," says Koivurova, emphasizing navigation and fishing rights as key factors. "We need to have 'one voice'—one single regional governance structure—to enable long-term planning horizon and concerted policy guidance."

The disabling absence of resultsoriented institutions and inconsistent mandates have led to regulatory gaps, according to the report. The seemingly ineffective Arctic Council, formally established in 1996, exacts no legally binding influence and limits participation of non-Arctic states despite their inevitable role in the ecosystem. In contrast, the WWF's proposal warrants "a new legally binding comprehensive agreement with a new institutional setup which will be able to ensure protection and preservation of the Arctic Ocean and sustainable ecosystem-based management of its resources."

The Arctic report identifies four critical elements of such an agreement, including:

- 1. Preservation of ecological processes
- 2. Long-term conservation and equitable use of marine resources
- 3. Current and future socio-economic benefits
- 4. Actions to address impending climate change

"What we envisage are such things as the precautionary principle, managing the area on the basis of science, ecosystem-based knowledge, and appropriate impact assessments," according to



Eichbaum. "And then they would set a series of priority areas for action, and negotiate detail and protocols."

Says Molenaar, "I think none of the Arctic states disagree that reform of the Arctic legal regime is necessary. The debate is only on the type and level of such reform."

The International Governance and Regulation of the Marine Arctic report and summary is available at www.worldwildlife.org via Places > Arctic > Publications > Reports.



If there are fish there tomorrow, that's better economically than catching all of the fish today.

Thus far, there doesn't seem to be very much interest at any official level in any government to take this on. Governments seem to be quite happy with the Arctic Council functioning as a study group and not as an action-oriented organization.

CURRENTS: What sorts of marine initiatives is WWF sponsoring?

EICHBAUM: There are several critical places where we work. They include the Arctic, the Galapagos, the Coral Triangle, Philippines, Indonesia, Malaysia, New Guinea, and Fiji—the home of much of marine biodiversity,

especially unique and rich corals and other taxon. We work in coastal East Africa from Kenya to the southern part of Mozambique. We have presence in the Gulf of Mexico and the Mesoamerican reef. Plus, my WWF international colleagues are very active in West Africa and the South China Sea.

In coastal East Africa, we work at a place called Kiunga, in the north of Kenya, where you can practically look over the border to Somalia. We're working there on the coast, with coastal communities, to preserve the wildlife and biodiversity. But we also work on health clinics, job creation

opportunities, microfinance, and those types of things to protect the environment in a way that is good for the people and brings stability to the area.

If you go to the Coral Triangle and Indonesia, you will discover issues of food security. Reliance on the sea is very, very important. So long-term fisheries sustainability is vital to the livelihood and stability of the region.

Globally, we have a large initiative on fisheries, where we try to bring sustainable practices to the world's fisheries. Most people know that nearly 70 percent of the commercial fisheries around the world are overfished or fished to capacity. The high seas pose a particularly critical problem because the governance regimes there are very weak. That's a very large focus for us—to bring new innovative practices to try to protect the world's fisheries.

We do this through two linked and parallel strategies. One is to strengthen the regional fish management organizations. Secondly, we try to achieve more economically viable fisheries where the fishermen really have an economic stake in sustainable management. If there are fish there tomorrow, that's better economically than catching all of the fish today.

As an example of a partnership, we work with industry, government, and other NGOs. It gets very complex particularly when economic issues become significant. We identify partners in industry that feed the world, who may look at the world though a more economic lens than we do, but

THE NATIONAL OCEANS POLICY

IN 2010, PRESIDENT Obama announced the creation of a new National Ocean Council with the vision of engaging educated and productive stewardship of the country's oceans, coasts, and Great Lakes region. The Council, comprised of representatives from a vast array of federal agencies, will promote a National Oceans Policy enacted by the President to maintain these invaluable regions as "healthy and resilient, safe and productive, and understood and treasured."

Highlights of the ten-point policy include:

- ▲ Bolster the conservation and sustainable uses of land in ways that will improve the health of ocean, coastal, and Great Lakes ecosystems.
- ▲ Use the best available science and knowledge to inform decisions affecting the ocean, our coasts, and the Great Lakes, and enhance humanity's capacity to understand, respond, and adapt to a changing global environment.
- Exercise rights and jurisdiction and perform duties in accordance with applicable international law, including respect for and preservation of navigational rights and freedoms, which are essential for the global economy and international peace and security.
- ▲ Increase scientific understanding of ocean, coastal, and Great Lakes ecosystems as part of the global interconnected systems of air, land, ice, and water, including their relationships to humans and their activities.

their long-term viability is dependent upon the sustainability of that world. That sustainability will protect biodiversity, so our interests overlap. So whether its Coca-Cola on fresh water, or the tuna industry on tuna conservation, partnerships become an important part of what we do.

CURRENTS: Can you talk about where we might find collaboration opportunities between the Navy and WWF?

EiCHBAUM: The Law of the Sea Convention is a good example. We'd like to see it get ratified. I think the Navy would like to see it ratified, and DoD has testified in front of Congress to that effect. I don't think we have much to offer about the details of how the Navy would operate in any given place in the context of the Law of the Sea, but it's in both of our interests to see it happen.

CURRENTS: How does public perception of NGOs affect WWF's efforts?

EiCHBAUM: Public perception is critically important. If you look back at the period of the 1960s and 1970s, you had Congress and President Nixon making extraordinarily important and fundamental steps in response to public clamor to put into place laws to protect the air, the water, and manage solid waste. Today, fifty years later, you have the opposite—a complete polarization in the political arena where one side is denigrating the science and arguing that responsible agencies should have reduced

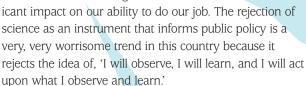
FOR MORE INFORMATION

FOR MORE DETAILS and additional perspective about Marine Spatial Planning, read our spotlight interview with Kristen Fletcher, Executive Director of the Coastal States Organization in the summer 2010 issue of *Currents*.



capacities to address these issues.

Why has that shift occurred? I'm not sure that I have the answer, but it clearly has occurred and it has a signif-



It's almost a complete rejection of rational thought. Why are we in such a worrying time? I think the proximate reason is the economic situation. The American public is worried in a way they have not been for four generations.

CURRENTS: It could be that your message may be lost among so many other issues facing Americans today.

EiCHBAUM: We're in a communications world that is fast and unmediated so that any message gains currency by its repetition, not by its validity. As an example, the environmental community collectively last year spent more money than it ever has in an effort to educate the public around issues of climate change and energy legislation. We were trying to explain why it was particularly important that Congress act. But by the end of that year, there were fewer people who believed in the issue or the need for action than at the beginning of the year.

CURRENTS: How might the Navy and the WWF collaborate in the execution of the National Oceans Policy?

EiCHBAUM: We think that what the President signed in July 2010 is very, very good. It's a big step forward. Now, we are thinking about what might be the most positive, constructive way that we can be involved in ongoing implementation. I'm most interested in the Arctic and how we implement up there. Under the policy, there is an immediate short term Arctic strategy that has to be done in six to eight months. I'm also interested in the area of marine spatial planning. It will be a great project to see what marine spatial planning really is for the United States. I think it's really important that everyone come to that process with an open mind and a willingness for vigorous debate, transparency, and flexibility. Active engagement of it, and being supportive of it, would be really important.

Navy Tests New Fuel in Seahawk Helicopter

Demo Provides "Off Ramp" from Petroleum-Based Fuels

MOVING CLOSER TO achieving the objective of decreasing its need for petroleum-based fuels, the Navy flew an MH-60S Seahawk helicopter on a 50/50 biofuel blend on 18 November 2010

The helicopter, from the Air Test and Evaluation Squadron Two One at Naval Air Station (NAS) Patuxent River, MD, tested a fuel mixture made surface warfare, combat support, humanitarian disaster relief and search and rescue, aero medical evacuation, special warfare and organic airborne mine countermeasures.

Earlier this year, the Navy tested this biofuel blend on the F/A-18 Super Hornet. Results from those tests indicated the aircraft performed as expected through its full flight envebiofuel blend for use in the Navy ships and aircraft by early 2012.

The Navy Fuels Team embarked on its current path to certify many alternative sources for fuel more than two years ago. At the 2009 Navy Energy Forum, Secretary of the Navy Ray Mabus committed the Navy to a goal of decreasing its reliance on fossil fuels. The Secretary outlined five

These biofuels provide the Navy with an 'off-ramp' from petroleum to increased energy security.

-Rear Admiral Philip Cullom, Director, Navy Task Force Energy

from the Camelina seed, which is in the same family of plants as the mustard seed and rapeseed. Camelina needs little water or nitrogen to flourish and can be grown on marginal agricultural soil.

"These biofuels provide the Navy with an 'off-ramp' from petroleum to increased energy security," said Rear Admiral Philip Cullom, director, Navy Task Force Energy.

Today's tests focused on the MH-60S, one of the Navy's newest helicopters. The mission of the MH60S is anti-

lope with no degradation of capability.

"We expect today's helicopter tests will further demonstrate this fuel made from an alternative, non-petroleum feed stock is a viable option for use in Navy aircraft," said Rick Kamin, the Navy Fuels Team lead.

According to Kamin, today's flight is another step toward the certification of fuels from non-petroleum sources for use in all Navy and Marine Corps aircraft. Testing will continue across additional aircraft models in 2011 with a target of approving the 50/50

energy targets at the Forum. Closest to home for the Navy Fuels team was the idea of demonstrating a Green Strike Group by 2012.

"In October 2009, I issued five energy targets for my department, the most important of which is that by the year 2020—a decade from now—half of all the energy we use afloat and ashore, in the air, on the sea, under the sea or on land will come from nonfossil-fuel sources," said Mabus in October 2010 at the Energy Security Forum held at the Pentagon.



A U.S. Navy MH-60S Sea Hawk helicopter assigned to the Blackjacks of Air Test and Evaluation Squadron (HX) 21 tests a 50/50 camelina seed-based biofuel blend at NAS Patuxent River, MD. The test demonstrates another step toward the certification of fuels from non-petroleum sources for use in all Navy and Marine Corps aircraft.

U.S. Navy photo by Sean Seremet

For More Insights

FOR MORE INSIGHTS into the Navy's use of camelina as a biofuel feedstock, read our story entitled "From Seed to Supersonic: How Camelina Powered the Navy's Premier Fighter Jet " in the winter 2011 issue of *Currents*. To subscribe to the magazine or browse the *Currents* archives, visit the Naval Air Systems Command's environmental web site at www.environavair.navy.mil/currents.

You can "like" *Currents* on Facebook by logging onto your account at www.facebook.com, searching for "U.S. Navy Currents magazine" then clicking the "Like" button. You can also find us at www.facebook.com/navycurrents. You can also follow *Currents* on Twitter at www.twitter.com/navycurrents. You can view the *Currents* photo archive on Flickr, visit www.flickr.com/photos/navycurrents.



In all, Secretary Mabus announced five energy goals for the Department of the Navy (DON) including:

- 1. By 2020, 50 percent of total DON energy consumption will come from alternative energy sources.
- 2. By 2020, DON will produce at least 50 percent of shore-based energy requirements from alternative sources; 50 percent of DON installations will be net-zero.
- 3. DON will demonstrate a Green Strike Group in local operations by 2012 and sail it by 2016.
- 4. By 2015, DON will reduce petroleum use in the commercial vehicle fleet by 50 percent.
- 5. Evaluation of energy factors will be mandatory when awarding contracts for systems and buildings.

"The most significant impact of a dependence on fossil fuels is on our people," Mabus said. "Getting a gallon of gasoline to a Marine at Forward Operating Base (FOB) in Afghanistan is not easy. Every single day, young Sailors, Marines, soldiers and airmen guard those vulnerable fuel convoys as they move from the logistics hubs to our FOBs. Gasoline is the single thing we import the most into Afghanistan."

"We have to change the way we operate. We have to change the way we produce and the way we use energy," Mabus said. \$\mathcal{J}\$.

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NASA & the Navy Developing the Fuel of the Future

Joint Effort Investigating Algae Farms in the Ocean

IN FEBRUARY 2011, the National Aeronautics and Space Administration (NASA) signed a Memorandum of Agreement (MOA) with the Navy to test a system for producing what many believe to be the fuel of the future, using algae grown in the ocean.

"Changing the way energy is used and produced in our country is the right thing to do," said Navy Secretary Ray Mabus, upon signing the agreement. "It's the right thing to do for in sediments. Under some conditions, with appropriate temperatures, pressures, and rock formations, they form oil that accumulates in reservoirs. Once discovered, these reservoirs can be tapped to meet our fossil fuel needs.

Fortunately, plants living today can also produce oil. For example, 50 gallons of fuel oil can be produced per year from an acre of soybeans, and 600 gallons can be produced from an acre of palm trees. The plants that produce the most

oil. On 22 April, Earth Day, 2010, the Navy flew an F/A-18 Super Hornet fighter jet at Mach 1.2, powered by a blend of conventional jet fuel and alternative aviation biofuel made from camelina oil. More recently, the Navy tested its RCB-X combat boat on a blend of conventional diesel and algae biodiesel, and flew an SH-60 helicopter on a similar blend. The important conclusion is that biofuels work—they function without redesigning engines and equipment.

Changing the way energy is used and produced in our country is the right thing to do.

-Navy Secretary Ray Mabus

our security, it's the right thing to do for our economy, and it's the right thing to do for our environment."

The Basics About Oil

The oil we use today comes from plants that lived in ancient times—mostly microscopic, single-celled, plants called microalgae, which lived in seas and lakes. When they died, they settled to the bottom and were buried

oil, however, are the modern versions of the microalgae that made most of our fossil oil. From among the thousands of known types of microalgae, researchers have discovered some species that can support production of between 2,000 and 5,000 gallons of oil per acre per year.

The Navy has taken the lead in demonstrating that it is possible to make functional fuel out of vegetable The next questions are, how do we produce enough of this fuel to meet our needs? How do we produce biofuels economically? How do we produce them without competing with agriculture for land, water, and fertilizer?

Transform Wastelands into Fuel Farms?

The Navy is testing fuels like camelina and algae because they are not food



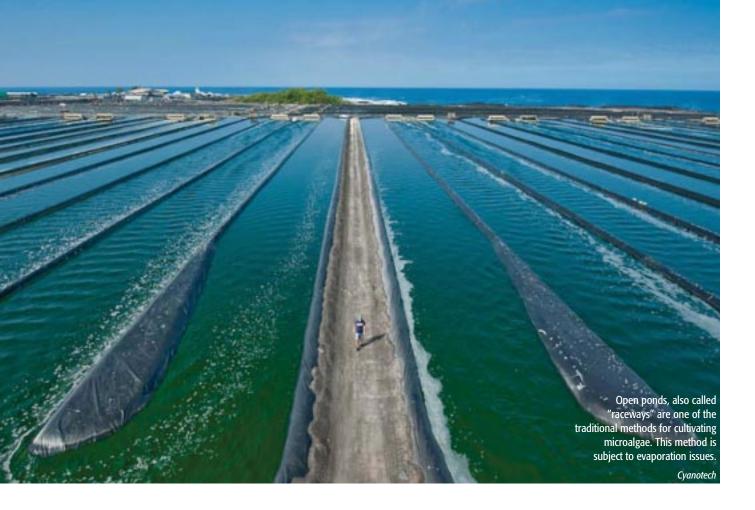
Prototype OMEGA photobioreactors being deployed in seawater tanks to grow microalgae on wastewater from the nearby sewage treatment plant. URS Corporation

crops and their production will not compete directly with agriculture. In this regard, microalgae is a superb potential source of biofuels, because it produces the most oil, it grows in water, and marine algae can even grow in seawater. At present, microalgae are commonly grown in shallow circulating channels called "raceways" or in transparent enclosures known as photobioreactors (PBR). To produce biofuels, thousands of acres of raceways and tens of thousands of PBRs will be required. In principle, to avoid competing with agriculture for land, raceways and PBRs can be located in deserts or on unusable fallow land. For water, they can use seawater and cultivate oilproducing marine algae.

For More Information

FOR MORE INFORMATION about the RCB-X demonstration, see our article entitled "Navy Fuels Great Green Fleet Vision: Latest Milestone on the Road to Energy Security" in the winter 2011 issue of *Currents*. For more insights into the Navy's success in flying an SH-60 helicopter on a blend of conventional and algae biodiesel blend, see our article entitled "Navy Tests New Fuel in Seahawk Helicopter: Demo Provides "Off Ramp" from Petroleum-Based Fuels" on page 16 of this issue of *Currents*.





It is estimated that replacing the evaporated water in these systems and maintaining appropriate salinities for most algae would require trillions of gallons of freshwater per year.

For fertilizer, they can use domestic wastewater from cities. This seems like a reasonable solution to our fuel challenge; however, there are a couple of problems with this scenario.

The Devil is in the Details

The primary reasons that there are not yet large-scale algae fuel farms in the desert are logistics and economics. If raceways or PBRs are installed in deserts, they would usually be far away from the coast and from major cities. Substantial costs would be involved in transporting the required seawater and domestic wastewater long distances to the desert installations. While it is possible to pump or ship water from one place to another,

this requires significant amounts of energy, which makes the final product more expensive.

With open-air raceways, evaporation is a problem, resulting in an increased need for freshwater. It is estimated that replacing the evaporated water in these systems and maintaining appropriate salinities for most algae would require trillions of gallons of freshwater per year.1 There is obviously little water in the desert. Transporting water is expensive, and the use of that much water could seriously compete with agriculture and impact our finite supply of a basic resource.

Evaporation is not a problem for PBR systems because they are

closed and sealed. But algae require sunlight for photosynthesis; and where there is sunlight, there is heat. Putting heat into a sealed chamber containing water raises the water temperature, and most species of algae die in hot water. Therefore, to maintain temperatures suitable for growing algae, PBRs need to be cooled. It is possible to spray the outside of the PBRs with freshwater and use evaporative cooling, but this technique creates another water use problem.

These considerations and other challenges have led to the conclusion that despite the great potential of microalgae, at least a decade may be required to produce significant

quantities of biofuels using traditional raceways or PBRs. The question then arises—is there another process that can be developed more quickly to grow the large quantities of oil-producing microalgae that the United States needs?

The OMEGA System

The Navy is teaming up with NASA to investigate a radical new approach to large-scale algae cultivation using a system called Offshore Membrane Enclosures for Growing Algae (OMEGA). The OMEGA system consists of floating PBRs filled with wastewater from existing offshore sewage outfalls and deployed in protected marine environments. The

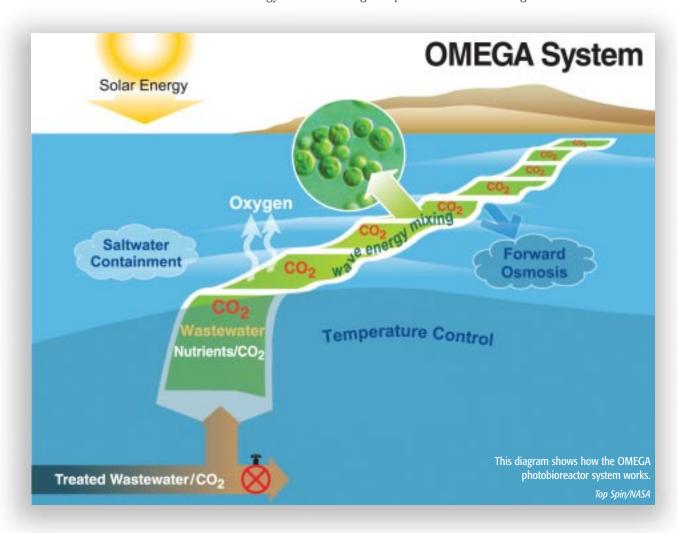
individual OMEGA modules are constructed of flexible plastic, clear on top, to allow light penetration for photosynthesis, and reinforced white plastic on the bottom, for strength. The modules are filled with secondary-treated wastewater and inoculated with freshwater algae. If the system leaks, it minimally impacts the environment because:

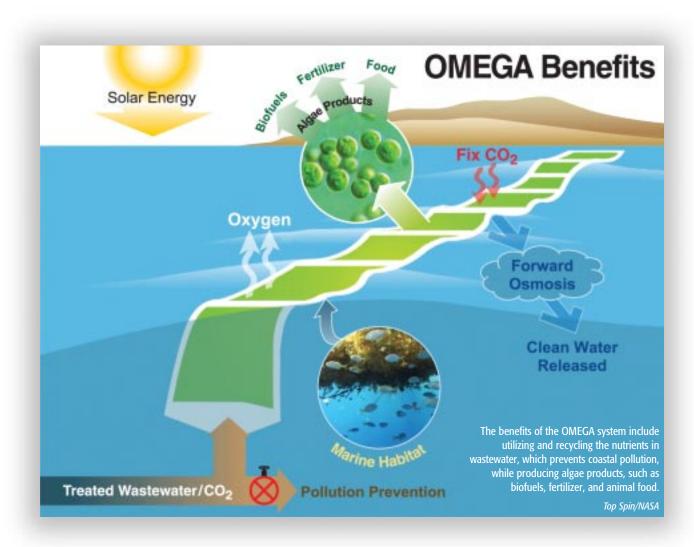
- 1. The wastewater is already approved for release into the ocean
- 2. The freshwater algae cannot survive in seawater

OMEGA utilizes virtually nothing except natural energy—solar energy to initiate photosynthesis and wave energy to maximize algae exposure to sunlight and to mix nutrients. Unlike land-based PBRs that can overheat, OMEGA uses the surrounding water for temperature control. It uses the salinity difference between wastewater and seawater both to prevent algae that escape from becoming invasive species and to drive forward osmosis (FO).

Forward osmosis is the process by which water moves across a selective semi-permeable membrane in the direction of concentrated salts. The OMEGA system uses FO to:

- 1. Concentrate nutrients in the wastewater, stimulating algae growth
- 2. Dewater the algae, facilitating harvesting





The challenges and rigor of space travel led NASA to design and develop equipment and life-support systems that optimize the use of resources, minimize the use of energy, and recycle, refurbish, and reuse everything.

3. Clean the wastewater released into the surrounding environment

It will be sensible to build first generation OMEGA farms in protected bays, in areas surrounded by breakwaters, or in places with existing marine infrastructure; such as offshore oil platforms or wind farms. In the vicinity of wind farms, OMEGA could use existing infrastructure and could benefit from the source of local energy for pumping water.

Why the Navy? Why NASA?

The military is the largest single user of fuels in the United States, and for the foreseeable future there will be a need to continue using liquid fuels; not only for aircraft and ships, but also for operations in remote locations. However, the danger and expense in transporting these fuels, and the dwindling reserves of fossil fuels, underscores the need for alternatives to fossil fuels.

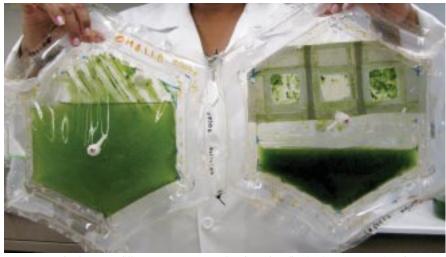
The aeronautics industry has also recognized the need for alternative fuels, but it is the technology developed for space travel that provided the foundation for the OMEGA project. The challenges and rigor of space travel led NASA to design and develop equipment and life-support systems that optimize the use of resources, minimize the use of energy, and recycle, refurbish, and reuse everything—materials that on earth are taken for granted or discarded as waste. It was with this

focus on efficiency and parsimony that OMEGA began.

The feasibility and scalability of the OMEGA system will be determined by combining NASA expertise with the knowledge and expertise of naval engineers, university professors and industry.

The State of OMEGA

Supported by the California Energy Commission and NASA's Aeronautics Research Mission Directorate, the team of NASA scientists, Navy engineers, civil engineers from URS Corporation,



Samples from two different OMEGA PBRs. After three days floating in seawater, microalgae grew in both photobioreactors, but the one with forward osmosis membranes significantly changed volume due to the loss of water into the seawater. This concentrates the microalgae.

Jonathan Trent



The inside of a PBR. PBRs are one of two ways that algae is farmed on land.

John Benemann

I don't want us to be remembered as the generation of locusts, who consumed everything and left nothing for future generations. I'd much rather have us be known as the "regeneration generation."

-Rear Admiral Phillip Cullom

and algae experts from the University of California at Santa Cruz, are building small-scale OMEGA PBRs in California. Floating these PBRs in seawater tanks, they are determining operating conditions for growing algae and treating wastewater. Naval engineers, using tow tanks and wave tanks, will determine how an OMEGA system will ultimately fare in the marine environment. These studies will guide the further development of durable PBR designs that can withstand the rigors of the marine environment, while providing



information about the energy return on investment and the feasibility of commercializing OMEGA systems.

If successful, the project has the potential to help the Navy reach its goal of finding an alternative to fossil fuels, energy independence and a more sustainable future. Rear Admiral Phillip Cullom said in a recent lecture: "I don't want us to be remembered as the generation of locusts, who consumed everything and left nothing for future generations. I'd much rather have us be known as the 'regeneration generation.'2" \$\mathcal{L}\$

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¹ Ronald Pate. 2007. Techno-economics, Siting and Resource Use Challenges for Onshore Algal Biofuels Production, Wind, Sea Algae Proceedings. http://wind-sea-algae.org?page.id = 305.

² RADM Phillip Cullom, October 2010. Keynote lecture at a meeting of the Algae Biomass Organization, Phoenix, AZ.







ey, all you would-be photographers out there: Give us your best shot.

How would you like to see your work published in a future issue of *Currents*? We know that, for many of you, photography is more than a casual pursuit. You love to capture unique views of the world with the click of a shutter. And we'd love to capture your best work.

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- Navy personnel protecting the environment, and/or
- Environmental management projects on Navy installations and ships.

With your submission (one image only, please), please provide your name, contact information, and a description of your image and how you shot it. Images must be submitted to our Managing Editor, Bruce McCaffrey at brucemccaffrey@sbcglobal.net in digital format (as .jpg files) at a resolution of at least 300 dots per inch (dpi).



Help us present the Navy's environmental efforts through your creative eye. We'll take a careful look at all submissions and try to find space to display as much of your inspired work as possible.

SO GIVE US YOUR BEST SHOT!

Assessing the Extent of Plastic Debris in the Ocean

NS Everett Manager Takes an Expedition to Assess the Danger

PERSONNEL FROM THE environmental program at Naval Station (NS) Everett, WA, recently took a hard look at the Navy's role in reducing plastic pollution in our ocean environment.

After 30 years of working with the U.S. Navy and Federal environmental agencies, John Miller, Environmental Program Manager at NS Everett decided to participate in a voyage that would provide further education on an issue he had been hearing much about—the global risk of plastic pollution at sea.

The Pacific Northwest is renowned as a major national seaport for global markets and also for its lush green landscapes. Its local citizens are likewise known for actively taking the lead on environmental protection issues.

The world's oceans and wildlife are increasingly being impacted by plastic debris. For the past 20 years, the Sea Education Association (SEA), a non-profit educational organization, has been measuring floating plastic marine debris found just under surface waters and using their findings for scientific research.

Despite Miller's familiarity with environmental programs and regulations, his experience with SEA left him with an even deeper appreciation for the lifecycle of plastic goods and

understanding of where trash and plastic pollution subsequently collects in the ocean.

"Having seen the amount of debris we collected, I am so much more



aware of the plastic we buy and dispose of on a daily basis," he said. "I thought I had good recycling habits, but now I also shop smarter."

The Journey

It all started with an opportunity to volunteer for a Plastics at Sea expedition, conducted by SEA. The 33-day sea excursion from June through July 2010 took Miller and 21 other volunteers to mid-North Atlantic waters, east of Bermuda, to observe and document plastic pollution in a remote ocean area.

During their adventure the crew took turns standing watch on a brigantine, the Sailing Ship Vessel (SSV) Corwith Cramer. Their mission involved a combination of science, navigation, and engineering aspects.

"The journey was very physical and quite exhausting," said Miller. "I was amazed though at how this diverse group of volunteers came together and efficiently gathered information on plastic pollution."

Ultimately, plastics in our oceans affect the food chain for all sea and human life. The purpose of the expedition was to gather data that would help answer questions such as 'What types of plastics are in the ocean?' and 'How does the plastic get there?'

"Initially you might think we'd come across large masses of rubbish floating around on the open sea, but actually most of the plastic we found on our trip was smaller than a pencil eraser," said Miller.

The majority of the plastic was collected in the form of small pieces by using net tows. The crew learned that once plastics enter the oceans, the material begins to break up due to



John Miller and 21 other volunteers sailed on the brigantine-rigged sailing vessel, SSV Corwith Cramer, during their 33 day Plastics at Sea expedition. Cramer is owned by the SEA educational organization and built as a research vessel for operation under sail.

John Miller

ultraviolet (UV) exposure and wave action. These small pieces can then become a habitat for bacteria and other microscopic organisms, which in turn may become ingested by larger animals.

"Some animals can be attracted to the reflectivity of the plastic, but many also feed in proximity to the debris,

and inadvertently take up the plastic," said Miller. "Fish, birds, turtles, and marine mammals that have been found with plastic pieces in their stomachs, further support the theory."

The ingestion of small plastic pieces is a danger for wildlife living in polluted areas. "The results of toxic consumption can lead to internal injuries,

Naval Station Everett Recycling Program

MANY RECYCLING FACILITIES today only deal with the standard plastics. However, NS Everett's recycling center is capable of processing all types of plastic (along with paper, glass and metal).

The more commonly used types of plastic are low-density polyethylene (LDPE (2)), high-density polyethylene (HDPE (4)) and polyethylene terephthalate (PET (6)). PET is the most commonly recycled plastic, and may be reused to make many new products such as polyester fiber for carpet, fabric, shoes, film, automotive parts, and containers for both food and non-food products.

In addition to processing these plastics, the Naval Station also has the special equipment necessary to process un-numbered and other miscellaneous plastic materials (except Styrofoam™). These could include plastic containers, plastic packaging, children's toys, and plastic furniture.

Common plastics are mixed together in a large horizontal baler. Miscellaneous plastics are separated and then formed into bales that weigh anywhere from 800 to over 1,000 pounds.

Holding educational programs and providing easily accessible recycling containers have assisted NS Everett in increasing the amount of plastic collected 173 percent since 2007. Recycling bins are placed conveniently in all building spaces, in each room at the barracks, and at the piers to collect plastic and other recyclable materials from home-ported ships, including the aircraft carrier USS Abraham Lincoln, USS Ingraham, USS Ford, USS Momsen, USS Rodney M. Davis, USS Shoup and U.S. Coast Guard Cutters Henry Blake and Blue Shark.



As part of the NS Everett recycling program, recycling bins are placed conveniently in all building spaces, in each room at the barracks, and at the piers to collect plastic and other recyclable materials from home-ported ships, including the aircraft carrier USS Abraham Lincoln (CVN 72).

Chief Mass Communication Specialist Eric S. Powell

This fiscal year, NS Everett is purchasing a large vehicle that will streamline pickup, and adding a conveyor to the auger compactor so that workers will be able to remove any misplaced recyclables. This will free up staff to spend more time on outreach—particularly meeting Sailors as they disembark to direct them to appropriate recycling containers.

malnutrition, and death," Miller explained. Besides posing a threat to living marine resources, another concern associated with plastic pollution is the unknown effect of the chemical release that occurs during decomposition and how it may impact water quality. These are just a few important concerns the team set out to investigate.

Members of the expedition collected water samples in addition to more than 43,000 pieces of plastic to be used for

further study at various universities and research institutions. The SEA hopes to contribute to research that will help to better determine the true impacts of plastic debris pollution in the oceans.

The Source

According to the SEA's findings, even though 90 percent of today's global commerce moves by sea, much of the smaller plastic debris may actually come from plastic packing materials. The majority flows from inland

streams, rivers, and waterways that connect in some way to the oceans.

"There are just too few ships traveling the oceans to account for the sheer amount of plastic we observed at sea," said Miller. "International maritime law prohibits the dumping of plastic in the oceans," he added, "although the effectiveness of the law would be hard to determine."

According to an article published by the Elsevier environmental research

28



During the Plastics at Sea expedition, volunteers used a Neuston Net for surface tows. The duration of each net tow was 30 minutes. During these surface tows, any plastics that were found in the nets were analyzed and identified in the research laboratory on the sailboat and stored for future analysis. *John Miller*

journal in 2008, plastic prevails as one of the most common pollutants in oceans worldwide "in quantities paralleling their level of production over the last half century."

The larger solution to the problem of plastics at sea may simply start with our packing choices and how we dispose of plastics. "Primarily, we need to go back to the source of plastics pollution, and resolve the problem from there," said Miller.

Plastic debris have been accumulating since plastics usage escalated between the 1920s and the 1940s. By the 1950s and 1960s, the use of plastic as packaging materials exploded. Coincidently, the first articles documenting plastic pollution in the oceans were published in scientific journals in the sixties. With each decade, dependence on plastic packaging materials has only increased.



In addition to collecting plastic debris, volunteers sampled the seawater during each tow. The water was filtered for chlorophyll analysis, which determines the biological productivity at each tow location.

John Miller

In 2007, according to the U.S. Environmental Protection Agency, plastic made up 12 percent of 254 million tons of waste. That amounts to more than 30 million tons of plastic waste produced in one year. Organizations like the SEA believe this current rate of plastic pollution can be greatly reduced by changing the way goods are packaged and through increasing recycling efforts.

Environmental Stewardship

Like many who have witnessed the damage and future health risk caused by pollution first-hand, Miller returned from the journey motivated to take action by spreading the word back at work. He gave a presentation about the voyage to the Navy's Regional Environmental and Public Works Department and the Snohomish County Marine Resources Committee.

According to Miller, NS Everett's environmental program has already implemented several successful projects to increase the use of alternative energy, prevent pollution, and reduce waste through recycling.



The majority of plastic collected in the net tows were particles no larger than a pencil eraser.

John Miller

"The Department of Defense plays a major role in the protection and conservation of wildlife and habitat, and the Navy is an active environmental steward," he said.

The Navy maintains community partnerships with local tribes and non-governmental organizations that support local conservation efforts, including working with private industries to protect shoreline resources. Miller's department and staff are heavily involved in several of these efforts.

Environmental awareness is encouraged through new employee classes and quarterly training, Earth Day and other base events, and as well as restoration and volunteer activities to clean up litter along shoreline areas.

Denise Lesniak, Integrated Solid Waste Manager at NS Everett, acknowledged a major challenge for many communities is that people may not realize how many materials can be recycled nowadays, especially when there are several of types of plastic items and various equipment needed to process them.

"We at NS Everett are incredibly proactive when it comes to recycling plastics and various other reusable items," said Lesniak. "We also partner with departments and tenant commands to enhance environmental awareness and encourage conservation and recycling practices." The base recycles up to 51 percent of all trash from its tenants, including remote locations at Pacific Beach, Jim Creek, and Smokey Point.

The Basics About the Sea Education Association

SEA IS AN educational institution dedicated to exploration, understanding and stewardship of the oceans, and to the study of humanity's relationship with the oceans. SEA offers students an interdisciplinary curriculum, on shore and at sea aboard tall ships, that provides challenging voyages of scientific discovery, academic rigor, and personal growth.

Since 1971, SEA has been a leader in off-campus study focused on marine science, maritime culture, and environmental studies. The SEA Semester study abroad programs challenge students intellectually and physically by combining the sailing adventure with study of the deep ocean and the interactions of humans and the sea.

For more information, visit www.sea.edu.







Volunteers on John Miller's Plastics at Sea expedition climb the SSV Corwith Cramer's rigging. John Miller

For Miller, making the journey was a way for him to develop his knowledge and raise awareness about plastic ocean pollution. Not everyone can to go to sea on a sailing expedition, but Miller was able to share the message with others poised to make a difference in his local area.

"It all starts with education and making people aware of the impact and what they can do to help in their daily lives," he said. "The only way for pollution to become less of an issue, is if we initiate the change."

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NAVFAC Headquarters Announces 2010 Drum-E Award Winners

Awards Recognize Excellence in Environmental Restoration

THE BATTLE EFFECTIVENESS—

or Battle "E"—Award has long recognized Navy ships or units that demonstrate the highest state of battle readiness. Using this same standard of excellence, in the late 1990s the Navy's Environmental Restoration program began recognizing outstanding individuals through the "Drum-E" awards.

4 nomination requires approval from NAVFAC Headquarters. The selection criteria is based on the outstanding contribution the Remedial Project Manager (RPM) made to the program during the past year either by saving money to the program, great progress towards our program cleanup goals, regulatory breakthroughs and teamwork or work on complicated or high

program at the former Hickam Air Force Environmental Restoration Projects. He was instrumental in transitioning the former Hickam Air Force Environmental Restoration Projects into NAVFAC Hawaii's management of the restoration sites. He had a key role in ensuring that the Hickam site's data was incorporated into the Navy's enterprise systems, and was the

The Drum-Es—named after the miniature oil drum-shaped trophy given to winners of the award, with an "E" for "environment"— are awarded annually, typically to one person from each of NAVFAC's Echelon 3 and 4 offices.

The Drum-Es—named after the miniature oil drum-shaped trophy given to winners of the award, with an "E" for "environment"—are awarded annually, typically to one person from each of the Naval Facilities Engineering Command's (NAVFAC) Echelon 3 and 4 offices. It is up to the field components to decide how the winners are selected. Some offices use a combination of peer selection and manager validation while others use a supervisor manager selection process. Each Echelon 3 and

visibility sites that requires a high level of coordination.

The following individuals have been selected to receive the Drum-E award for Fiscal Year (FY) 2010:

Brian Whitehouse

Naval Facilities Engineering Command Hawaii—Restoration Employee of the Year

Mr. Whitehouse is the primary RPM for the Navy's Munitions Response

driving force behind ensuring all tasks were completed and rolled into the NAVFAC Hawaii environmental restoration budget.

Jan Kotoshirodo

Naval Facilities Engineering Command Hawaii—Restoration Employee of the Year

Ms. Kotoshirodo is the RPM for the Installation Restoration projects primarily at Ford Island and Navy retained parcels at former Naval Air

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Cleanup efforts at Naval Security Group Activity Skaggs Island earned NAVFAC Southwest the California Transportation Foundation 2010 Environmental Enhancement Project of the Year Award.

Station (NAS) Barbers Point. She has also been a key force in ensuring the smooth transition of Hickam Air Force Environmental Restoration project data into NAVFAC. She developed and provided training for the Hickam RPMs on various NAVFAC enterprise systems, and was instrumental in working between Hickam and NAVFAC Headquarters to ensure agreement on the Hickam sites loaded into the NAVFAC system.

Brenda Reese

Naval Facilities Engineering Command Southwest— Restoration Employee of the Year

Ms. Reese is an RPM at NAVFAC Southwest, Desert Integrated Project Team. During FY 2010, she worked on some of NAVFAC Southwest's most critical and visible projects as an RPM assigned to Naval Security Group Activity Skaggs Island and Naval Undersea Surveillance Centerville Beach. She completed the environmental restoration program at Skaggs Island to facilitate the non-

Backfilling at Defense Reutilization and Marketing Office salvage yard, solid waste management unit 12, in Apra Harbor Naval Complex, Guam.

Base Realignment and Closure (BRAC) transfer of the property to the U.S. Fish and Wildlife Service for wildlife preservation use. The transfer of this property is a high priority because of maintenance costs and unsuccessful past attempts to transfer the property due to ecological cleanup issues. Ms. Reese's contribution to the Environmental Restoration, Navy (ERN) cleanup at Skaggs Island resulted in NAVFAC Southwest winning the California Transportation Foundation 2010 Environmental Enhancement Project of the Year Award.





Heather Wochnick

Naval Facilities Engineering Command Southwest— BRAC Restoration Employee of the Year

Ms. Wochnick is the lead RPM for Mare Island, China Lake, and San Diego Naval Training Center, and served as interim BRAC Environmental Coordinator at Mare Island for six months. During FY 2010, she identified a number of problem areas at Mare Island, including areas with materials posing potential explosive hazard (MPPEH). Ms. Wochnick has since become the go-to person for MPPEH issues at the San Diego BRAC office. She directly managed Mare Island transfer issues, revived the Naval Training Center (NTC) Boat Channel Feasibility Study and organized regulatory agency meetings to help achieve the closure of NTC's final site.

Kris Saboda

Naval Facilities Engineering Command Pacific— Restoration Employee of the Year

Ms. Saboda is NAVFAC Pacific's quality assurance manager and an RPM. She is building a successful quality management program for NAVFAC Pacific, Hawaii, and Marianas's restoration program. In FY 2010, Ms. Saboda earned a Manager of Quality/Organizational Excellence Certification from the American Society of Quality. Using these skills,

she prepared a Quality Management Plan in-house and finalized the Pearl Harbor and Naval Computer and Telecommunications Area Master Station Quality Assurance Protection Plan. Ms. Saboda also achieved a "response complete" designation for two sites in 2010 and volunteered to step in as a temporary supervisor preparing the fall budget and managing execution, while still performing her other assignments.

Joe Rail

Naval Facilities Engineering Command Washington— Restoration Employee of the Year

Mr. Rail has made significant contributions to the Navy Restoration program in his role as the remedial project manager for Naval Support Facility Indian Head (NSF-IH) and the former Naval Training Center in Bainbridge, MD. In FY 2010, Mr. Rail oversaw a challenging removal action at NSF-IH to address munitions and explosives of concern and polychlorinated biphenyls in soil. In addition to many technical challenges, the work required a tremendous amount of upfront planning and coordination with numerous parties at the Naval Surface Warfare Center. More than 2,000 items were successfully demilitarized and 1,400 tons of contaminated soil was removed from the site in four short months without incident.

Dwight Leisle

Naval Facilities Engineering Command Northwest—Restoration Employee of the Year

Mr. Leisle is the lead RPM for the Bremerton Naval Complex and the former Puget Sound Naval Station at Sand Point, Washington, supporting both the Navy Environmental Restoration program and the BRAC program. At NAVFAC Northwest's Jackson Park Housing Complex, Mr. Leisle successfully concluded data collection requirement negotiations for the Ecological Risk Assessment (ERA) Work Plan in a difficult regulatory climate. It is expected that the results of the ERA will result in a No Further Action decision, saving over two million dollars in monitoring costs.

Robert Magee

Naval Facilities Engineering Command Atlantic—Restoration Employee of the Year

In 2009, Mr. Magee volunteered to assist the NAVFAC Midwest Restoration Program manager in optimizing and developing an exit strategy for the Naval Industrial Reserve Ordnance Plant groundwater extraction system in Fridley, Minnesota.

Since joining the project team, Mr. Magee's role has expanded due his actions and reliability, to the point where he is essentially the leader of the Navy's team and the project manager's "go to" person. In late FY 2010, despite innovative well rehabilitation techniques, the primary extraction well essentially failed. Regulatory agencies demanded the Navy replace the well immediately or face significant consequences. With Mr. Magee's lead, the Navy team developed a strategy that addressed the groundwater plume hydraulic control issues. The strategy was accepted by the regulatory agencies and has led to an approach which, in the long term, will be more effective from a performance and cost standpoint.

Charles Cook

Naval Facilities Engineering Command Southeast—Restoration Employee of the Year

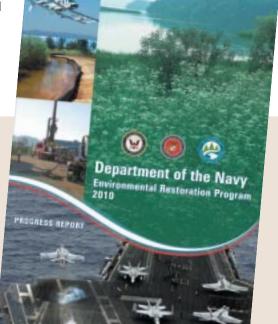
Throughout FY 2010, Mr. Cook has effectively managed a challenging restoration program at the National Priorities List installation Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina. Mr. Cook demonstrated a high level of tech-

nical proficiency in Navy guidance and risk management by applying his expertise to completing the MCRD Parris Island Site 3 Technical Memo and Proposed Plan in accordance with the Federal Facilities Agreement. In FY 2010, Mr. Cook decreased the Parris Island munitions response program cost to complete by over two million dollars. These refinements have resulted in a more accurate ERN funding profile and allow limited resources to be reallocated.

Dave Cleland

Naval Facilities Engineering Command Mid-Atlantic—Restoration Employee of the Year

Mr. Cleland is recognized for his outstanding contribution to the Navy Environmental Restoration program as an RPM for Marine Corps Base Camp Lejeune in Jacksonville, North Carolina. In FY 2010, Mr. Cleland



Department of the Navy Releases Environmental Restoration Program Progress Report

THE DEPARTMENT OF the Navy has just released its biannual Environmental Restoration Program Progress report, which provides the status of cleanup at the end of FY 2009 and outlines the Navy's plans for completing Installation Restoration and Munitions Response projects in the future. The report serves as a primer for understanding the process of cleaning up past contamination at Department of the Navy installations and is a valuable source of information on the overall progress and success the program has achieved.

The report is available for download at https://portal.navfac.navy.mil/go/erb.

awarded approximately \$11 million and over 40 contract actions related to ERN and Marine Corps activity funds. Highlights of Marine Corps Base Camp Lejeune's ERN program include signed records of decision and remedial action implementation for two sites, seven installation restoration and four munitions response program No Further Action documents approved, a finalized fiveyear review, and a completed basewide Explosive Safety Submission (ESS). The ESS allowed munitions response investigations to be completed more efficiently and safely, assisting the partnering team to reach concurrence on the path forward for 24 sites.

Todd Bober

Naval Facilities Engineering Command Mid-Atlantic—BRAC Restoration Employee of the Year

After providing 15 years of environmental restoration technical support while at Engineering Field Activity Northeast, Mr. Bober became an RPM for BRAC Program Management Office, Northeast in early 2008. With this move, Mr. Bober inherited an environmental restoration program at NAS Brunswick that was in the process of receiving stipulated penalties from the U.S. Environmental Protection Agency (EPA). While under the scrutinizing eyes of many, Mr.



Bober ramped up the BRAC cleanup program, reestablished relationships with regulatory agencies, and aggressively sought solutions for the continuous challenges presented by the complex and fast paced requirements necessary for base closure in 2011. In addition to his execution of NAS Brunswick's \$10 million annual restoration program in FY 2010, Mr. Bober also championed efforts to improve the sustainability of NAS Brunswick's groundwater treatment system by reducing power consumption while maintaining system treatment effectiveness.

Bryan Harre

Naval Facilities Engineering Command Engineering Service Center— Restoration Employee of the Year

Mr. Harre has made significant contributions to the Navy Restoration program in his role as a team leader and facilitator for NAVFAC's Munitions Response Program (MRP) Workgroup. In FY 2010, Mr. Harre worked closely with the MRP and cost-to-complete workgroups to develop Microsoft Excel-based workbook templates to assist RPMs in estimating cleanup costs for sites under the MRP. Two MRP templates have been completed to date—one pertains to removal actions for underwater munitions, and the other addresses the Remedial Investigation/Feasibility Study phase for terrestrial sites. Mr. Harre has also written proposals and been involved with several projects funded by the Strategic Environmental Research

In FY 2010, a High-Pressure Oxygen (HiPOx) unit was installed at NAS Brunswick to treat groundwater contamination. Three new groundwater extraction wells were also installed to optimize the groundwater treatment system.

and Development Program, Environmental Security Technology Certification Program, and Navy Environmental Sustainability to Development program. He is often used as a subject matter expert reviewer of these proposals.

Donna Caldwell

Naval Facilities Engineering Command Atlantic—Restoration Employee of the Year

Ms. Caldwell serves as the Navy's subject matter expert on Vapor Intrusion (VI), assisting RPMs with various complex issues. She leads the VI focus group—comprised of Department of Defense and industry experts-to advance the Navy's approach to VI. In FY 2010, Ms. Caldwell led the development of a VI web-based decision tool to further assist RPMs with the evaluation and communication of VI assessments. She was instrumental in the negotiation with various stakeholders, employing consistent processes across the Navy. Ms. Caldwell also works with the Navy and EPA to improve the quality of Navy Records of Decision. She has assisted NAVFAC with new and improved methods for the generation of Conceptual Site Models and Applicable or Relevant and Appropriate Requirements, and she developed a cost-effective strategy for the cleanup of landfills that will save the Navy significant resources and accelerate site closure. 💃

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CNO Announces FY 2010 Environmental Award Winners

Program Recognizes Exceptional Environmental Stewardship

WINNERS OF THE Fiscal Year (FY) 2010 Chief of Naval Operations (CNO) Environmental Awards competition, sponsored by the CNO Energy and Environmental Readiness Division, were announced 17 February 2011.

The annual CNO Environmental Awards program recognizes exceptional environmental stewardship by Navy ships, installations and people. Twenty-seven winners were selected in ten award categories. The winners, listed alphabetically within each category, are provided below.

Natural Resources Conservation, Large Installation Award

- Naval Air Station Lemoore. CA
- Naval Base Coronado, CA
- Naval Base Ventura County, CA

Cultural Resources Management, Installation Award

- Naval Air Station Fallon, NV
- Naval Base Guam

Environmental Quality, Industrial Installation Award

- Fleet Readiness Center East, Cherry Point, NC
- Naval Submarine Base Kings Bay, GA
- Naval Weapons Station Seal Beach, CA (including Detachments Corona and Fallbrook)

Environmental Quality, Overseas Installation Award

- Commander, Fleet Activities Yokosuka, Japan
- Navy Region Center, Singapore
- U.S. Naval Support Activity Bahrain

Environmental Quality, Small Ship Award

- USS MOMSEN (DDG 92)
- USS STERETT (DDG 104)
- USS THACH (FFG 43)

Sustainability, Individual or Team Award

- Environmental Sustainability Team, Fleet and Industrial Supply Center Pearl Harbor, HI
- Fleet Readiness Center Southeast, Jacksonville, FL
- PMA-231 Environment, Safety, and Occupational Health Team, Naval Air Systems Command, Patuxent River, MD

Sustainability, Non-Industrial Installation Award

- Naval Base San Diego, CA
- Naval Station Great Lakes, IL
- Naval Station Pearl Harbor, HI



- Hunters Point Naval Shipyard, CA
- Joint Expeditionary Base Little Creek-Fort Story, VA
- Naval Station Norfolk, VA

Environmental Excellence in Weapon System Acquisition, Small Program, Individual or Team Award

 Battle Force Tactical Trainer In-Service Engineering Agent Design Team, Naval Sea Systems Command Combat Direction Systems, Dam Neck, VA

Environmental Planning Team Award

- East Coast Range Complex Environmental Planning Team, Commander, U.S. Fleet Forces Command
- Southern California Range Complex Environmental Planning Team, Commander, U.S. Pacific Fleet
- Undersea Warfare Training Range Environmental Planning Team, Commander, U.S. Fleet Forces Command

Vice Admiral William R. Burke, deputy chief of naval operations for Fleet Readiness and Logistics, commended the winners.

"Bravo Zulu to all award winners, and to the many other nominees," said Burke. "You exemplify the Navy's steadfast commitment to protecting and sustaining the natural environment as a global force for good."

The CNO award winners will be honored 7 June 2011, in a ceremony at the United States Navy Memorial in Washington, DC.

For more news from the Chief of Naval Operations Energy and Environmental Readiness Division visit http://greenfleet.dodlive.mil/environment.

For more news from Ocean Stewardship, visit http://www.navy.mil/local/oceans. $\mathring{\bot}$

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Greenfleet Online

Navy Unveils New Energy, Environment & Climate Change Web Site

THE DEPARTMENT OF the Navy has unveiled a new Energy, Environment and Climate Change web site, located at http://greenfleet.dodlive.mil.

The web site provides news and information about Navy programs to achieve energy security, practice environmental stewardship, and understand the potential challenges presented by a changing climate. These programs serve to increase combat capability and ensure mission readiness in the decades to come. Content on the site focuses on the Navy's successes and initiatives in those three areas, outlined below.



The Department of the Navy's new Energy, Environment and Climate Change web site available at http://greenfleet.dodlive.mil.

Energy Security

The Navy's energy programs focus on having an adequate, reliable, and sustainable energy supply sufficient to meet the demands of the Navy's mission. As part of this effort, the Navy aims to reduce energy

demand and increase alternative and renewable energy supply. The recent testing of the experimental RCB-X riverine command boat using a 50-50 blend of an algae-based biofuel and petroleum was a step toward accomplishing these goals.

For More Information

FOR MORE INFORMATION about the Navy's demonstration of the RCB-X, read our article in the winter 2011 issue of *Currents* entitled "Navy Fuels Great Green Fleet Vision: Latest Milestone on the Road to Energy Security." To subscribe to the magazine or browse the *Currents* archives, visit the Naval Air Systems Command's environmental web site at www.enviro-navair.navy.mil/currents.

You can "like" *Currents* on Facebook by logging onto your account at www.facebook.com, searching for "U.S. Navy Currents magazine" then clicking the "Like" button. You can also find *Currents* at www.facebook.com/navycurrents and follow *Currents* on Twitter at www.twitter.com/navycurrents.





The environment section of the Navy's new Energy, Environment and Climate Change web site includes news, video, and information about the Navy's environmental stewardship efforts.

Environmental Stewardship

Environmental stewardship enables Sailors to carry out their missions while minimizing impacts on the environment, both afloat and ashore. The Navy is committed to continuing its strong track record of environmental stewardship. This includes efforts to assess and mitigate greenhouse gas emissions, protect marine life during training and testing at sea, and implement technologies and processes to safely manage waste without compromising core mission capabilities.

Climate Change

In May 2009, the Chief of Naval Operations created Task Force Climate Change to make recommendations to Navy leadership regarding policy, strategy, force structure and investments relating to the Arctic and global climate change.

To learn more about the U.S. Navy's Energy, Environment and Climate Change programs, visit http://greenfleet.dodlive.mil. 💃

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Be Part of Our Fall Issue

Submissions Are Due by 22 July

We're already planning our fall 2011 issue.

And you can be a part of it! If you have a story that you want us to consider, you need to submit your final text and images by 22 July 2011.

The power of

We look forward to reading your stories about all the great work you're doing as the Navy's stewards of the environment.

The power of your experiences is even greater when you share them with our readers.

Your chances of being published in *Currents* are dramatically increased if you follow our article template. Simply request this easy-to-use template by sending an email to Bruce McCaffrey, our Managing Editor, at brucemccaffrey@sbcglobal.net. Bruce is available at 773-376-6200 if you have any questions or would like to discuss your story ideas.

Currents Deadlines

Fall 2011 Issue: Friday, 22 July 2011 Winter 2012 Issue: Friday, 21 October 2011 Spring 2012 Issue: Friday, 20 January 2012 Summer 2012 Issue: Friday, 20 April 2012

You can also refer to your *Currents* calendar for reminders about these deadlines



Fuel-Saving Green Locomotive Debuts at NSA Crane

Base Accepts Delivery of First Environmentally Friendly Locomotive

A NEW ENVIRONMENTALLY

friendly locomotive entered service at Naval Support Activity (NSA) Crane, IN in January 2011, helping to ship ordnance to U.S. forces around the world while also helping reduce the Department of Defense's consumption of fossil fuels.

The "N-ViroMotive" is a 120-ton switcher locomotive that runs on biodiesel fuel. It consumes half the fuel

ordnance transfer operations, and significantly reduce its impact on the environment." PWD Crane procured the locomotive and put it into service in mid-January 2011. After the first two weeks of operation, Sims reported that "it's already exceeding our expectations."

The locomotive is one of eight used to stage Crane Army Ammunition Activity (CAAA) ordnance for shipbrand-new locomotives and overhaul one more. Sims said the new models' improvements will ultimately allow the PWD to support CAAA using fewer locomotives.

"This locomotive includes advanced engine technology, is lighter than our older models, and is more efficient and reliable," said Sims.

The N-ViroMotive uses a Gen Set engine, which is actually a series of

This locomotive includes advanced engine technology, is lighter than our older models, and is more efficient and reliable.

-Gerald Sims

of conventional models and is certified by the U.S. Environmental Protection Agency (EPA) for low emissions.

"This is a win-win investment," said Gerald Sims, Base Support Vehicles and Equipment branch manager for Naval Facilities Engineering Command (NAVFAC) Midwest's Public Works Department (PWD) Crane. "This new locomotive will last the Navy 20 to 25 years, provide improved reliability supporting ment to U.S. forces around the world. PWD crews operate the locomotives along more than 95 miles of railroad running between magazines throughout the heavily wooded 63,000-acre base.

This was the PWD's first locomotive to be overhauled by Illinois-based National Railway Equipment Company as part of a plan to upgrade the base's fleet. Over the next two years, NAVFAC will purchase two

engines that turn a generator. The GenSet engine, matched with a system of computer and electronic controls, provides all the horsepower of a traditional single-engine locomotive, along with a 40-60 percent reduction in fuel consumption, 85-90 percent reductions in nitrogen oxide and particulate matter emissions, an 85 percent reduction in noise, and 35-50 percent lower maintenance costs.

"All of that means it can operate more efficiently, consuming less fuel and



A new environmentally-friendly 120-ton switcher locomotive, the N-ViroMotive, pulls ordnance cars at NSA Crane. It is one of eight locomotives used on base to stage CAAA ordnance for shipment to U.S. forces around the world. Procured and operated by NAVFAC Midwest's PWD Crane, it runs on bio-diesel fuel and is certified by EPA for low emissions. *Jayna Turpin*

reducing maintenance down time," explains Sims. "If this locomotive's diesel power plant requires major maintenance or has any mechanical problems, we can just swap it out for another power plant that's ready to go," said Sims. "With the older models, it has been getting more difficult and time consuming just to locate repair parts before we can even begin repairs. With this new system we can swap out the entire power plant and install a new one within a day or so."

Approximately 50-65 percent of the total fuel savings generated are derived from advanced Cummins Engine technology and design effi-

ciency improvements. Other fuel savings are achieved by an electronically activated and controlled system which monitors engine idling and, after a specified period of time, automatically shifts the engine or engines to sleep mode.

The N-ViroMotive's cost, about \$850,000, was paid for through Base Support Vehicles & Equipment rate charges, mainly through CAAA mission surge support.

Established in 1941, NSA Crane provides high-tech acquisition and fleet support focused on ordnance, electronics, and electronic warfare for the Navy, Marine Corps, Air Force,

Special Operations Command, Coast Guard, the National Aeronautics and Space Administration and many other military, civilian and foreign military organizations.

NAVFAC Midwest provides civil engineering, public works, and environmental support to Navy, Marine Corps and other Department of Defense activities across the 16 states that comprise Navy Region Midwest. \$\mathcal{J}\$

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NRSW Participates in Energy **Incentive Programs**

Efforts Reduce Consumption & Set Green Example

NAVY REGION SOUTHWEST

(NRSW) and Naval Facilities Engineering Command Southwest (NAVFAC SW) participate in a number of energy incentive programs that allow them to reduce consumption and set a greener example to tenant commands and area Sailors.

Many programs have been created by federal, state and local agencies to

encourage individuals, companies and organizations to reduce energy and water consumption, build renewable energy resources, and use alternative fuels. Federal regulations allow installations to participate in these programs and retain incentive payments locally to use for energy and water conservation projects. NRSW deposits incentive payments into the Region's utility account and makes funds available to the installations that qualify for the programs.

One such installation was Naval Base Coronado, which received \$113,294 in energy incentive payments for base-wide improvements in 2010 under a program run by investorowned utility companies (IOU). In California, IOUs oversee a set of programs designed to decrease energy use in lighting, appliances, heating, ventilation and air conditioning, motors, building renovations, and new construction.

One project involved replacing inefficient refrigerators in authorized break rooms throughout the installation with Energy Star refrigerators.

"The Public Works Department set up a program for the exchange of older refrigerators with new units purchased with incentives funds," NRSW Utilities and Energy Program Manager Bernie Lindsey explained. "These refrigerators use approximately fifty percent less





Old mini refrigerators from Naval Base Coronado at the recycling facility. Fred Speece

energy than the old models," he continued. In-house staff was used to install the 120 new refrigerators and to haul away the old ones, which were removed from the base and recycled. This single measure will save the Navy approximately 60,000 kilowatt-hours (kWh) annually, or 900,000 kWh over the life of the refrigerators resulting in a savings of \$100,000.

energy efficient technologies have higher initial costs in most cases, lifecycle costs generally prove them to be more effective," he said.

Also in 2010, Naval Base San Diego replaced 1,182 street and parking lot lights with light-emitting diode (LED) lamps to save from 50 to 80 percent of the energy consumed by traditional high and low-pressure sodium

nado and Naval Base Point Loma, where nearly every street and parking lot light on the bases will be replaced with an LED bulb. Naval Base San Diego, meanwhile, plans to replace its perimeter lighting with LEDs. Naval Base Ventura County installed nearly 1,200 LED light fixtures during 2010. The project included 537 street and parking lot fixtures and 661 exterior building fixtures that will save over 400,000 kWh per year worth \$55,000. Other Navy Region Southwest bases have submitted similar exterior lighting projects for Sustainment, Restoration and Modernization funding or to be financed under Utility Energy Service Contracts (UESC). These projects together will save the Navy hundreds of thousands of dollars per year while providing improved nighttime lighting.

Another program that qualified for energy initiatives in the region was a boiler replacement project at Naval Air Weapons Station (NAWS) China Lake. This project was executed under a financed UESC contract. NAWS China Lake replaced a 20-year-old boiler with a 78 percent efficiency

Although energy efficient technologies have higher initial costs in most cases, lifecycle costs generally prove them to be more effective.

-Bernie Lindsey

"These incentive programs improve consumer awareness, increase the availability and demand for energy efficiency products, and promote emerging technologies," Lindsey commented. "Financial incentives encourage the replacement of inefficient systems and building components with efficient ones. Although

lamps. This project saves over 1,400,000 kWh per year worth \$157,000 and earned Naval Base San Diego a rebate of \$147,000 that will be used for further energy conservation investments.

Similar LED replacement projects are underway at Naval Base Coro-

rating with an 84 percent efficient unit with a heat recovery system. The project also included expansion of the natural gas system to eliminate propane use in various locations, installation of a water well replacement project, and Supervisory Control and Data Acquisition controls. The project was completed in 2009 at a

cost of \$3,300,000. The improvements are now saving the Navy \$150,000 and 2,500 Million British Thermal Units per year—this is roughly enough energy to power 65 houses at China Lake each year. This project received a \$33,000 rebate from Pacific Gas & Electric Company.

California Solar Initiative incentives with potential value of \$678,000.

Another program sponsored by four of California's largest utilities is called Savings By Design. This program provides incentives for energy efficiency measures in new construction

ronmental Design (LEED) -certified building. The Navy received \$293,000 in incentive funds for this facility. The Navy is scheduled to receive \$70,000 in incentive funds in FY11 for the Weapons and Armaments Technology Laboratory. These rebates do not reflect the significant

These projects generate about 4.6 million kWh of renewable energy per year worth over \$500,000.

"Our energy conservation program is remarkable in that many innovations are implemented through an integrated approach with a network of government energy managers and contract Resource Efficiency Managers throughout the Region," Lindsey stated. "NRSW will serve as an inspiration for other federal agencies and organizations," he continued.

According to Lindsey, NRSW has been participating in various energy incentives programs for ten years, with several facilities receiving rebates for energy and water-savings projects. In

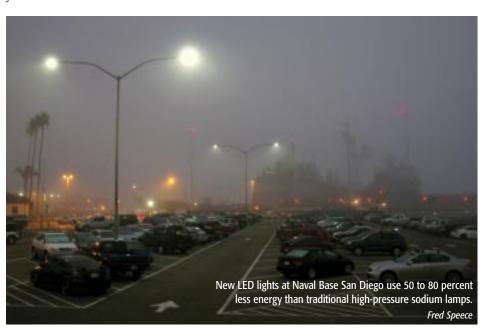
the past five years alone, NRSW installations have secured \$2.2 million in state and utility incentives.

In 2009 and 2010, nine NRSW bases and the Space and Naval Warfare (SPAWAR) Systems Center Pacific installed 35 solar roofs under the American Recovery and Reinvestment Act. These projects generate about 4.6 million kWh of renewable energy per year worth over \$500,000. Many of these projects also qualify for

and major renovations. The program offers building owners and their design teams a range of services, including design assistance and owner incentives (up to \$500,000) to help offset the costs of new energyefficient buildings, and design team incentives (up to \$50,000) to reward designers who meet ambitious energy efficiency targets.

Two buildings at NAWS China Lake qualified for this program. The William B. McLean Laboratory is a gold Leadership in Energy and Envienergy savings expected throughout the facilities' lifecycle. For example, each facility's landscaping system uses 67 to 74 percent less water than a "typical" system of its size. Overall, each building is expected to achieve an annual energy savings of 18 to 22 percent.

"This is what we need to be doing going forward," commented Lindsey. "We need to make sure we design a building for maximum energy efficiency before ground is ever broken," he said.





We need to make sure we design a building for maximum energy efficiency before ground is ever broken.

-Bernie Lindsey

Naval Facilities Engineering Command Southwest

One of ten facilities engineering commands in NAVFAC, NAVFAC SW is responsible for the public works, planning, engineering/design, construction, real estate, environmental services, and acquisition/disposal of facilities and real estate in a six state area on the West Coast. NAVFAC SW contracts with commercial businesses to produce and deliver construction for the military such as housing, piers, airfields and hospitals. The command also provides public works services such as transportation, maintenance, utilities/energy delivery, facilities management and base operations support to the Navy and Marine Corps Installations within its geographic area of responsibility as well as support to other federal agencies in California.

Navy Region Southwest

As the Naval shore installation management headquarters for the Southwest region (California, Arizona and

Nevada), NRSW provides coordination of base operating support functions for operating forces throughout the region. This includes providing expertise in areas such as housing, environmental, security, family services, port services, air services, bachelor quarters, supply, medical and logistical concerns for the hundreds of thousands of active duty, reserve and retired military members in the area. The command also serves as the regional coordinator for the Commander, U. S. Pacific Fleet, headquartered in Hawaii, coordinating support for bases in Southern California and Nevada. \$\mathcal{L}\$

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SERDP & ESTCP Recognize Outstanding Efforts at Annual Symposium

Winners Include a Modeling Effort Which Distinguishes Between UXO & Harmless Metal Objects

SIX PROJECT-OF-THE-YEAR

Award recipients were announced at the 2010 Partners in Environmental Technology Technical Symposium and Workshop sponsored by the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) 30 November to 2 December 2010 in Washington, D.C. More than 1,200

Environmental Restoration, SERDP Project of the Year

Improved Understanding of the Biodegradation of cis-Dichloroethene and Vinyl Chloride

Mr. Evan Cox (Geosyntec Consultants, Inc.), Dr. James Gossett (Cornell University), Dr. James Spain (Georgia Institute of Technology), and their colleagues identified and explained





processes that break down these contaminants to the point where the harmful chemicals are fully degraded and the site is remediated. But at a

The possible routes and rate for the continued degradation of DCE and VC have been a subject of great debate in the scientific literature with significant economic and risk consequences.

environmental professionals from government agencies, academia, and the private sector were on hand for the opening plenary session at which the awards were presented. The awards honor principal investigators who, through their outstanding efforts, have helped the Department of Defense (DoD) achieve its mission while improving its environmental performance. Award recipients include:

how chlorinated solvents in groundwater can continue to degrade through biological processes even on sites that appear to lack the characteristics necessary for such processes to occur.

Chlorinated solvents are the most common source of contaminated groundwater on DoD lands. Most DoD sites are cleaned up by either introduced or natural biological significant number of sites, the process appears to stall at a point where the solvents have been degraded into the toxic chemicals cisdichloroethene (DCE) and vinyl chloride (VC). The possible routes and rate for the continued degradation of these chemicals have been a subject of great debate in the scientific literature with significant economic and risk consequences.



Having resolved a longstanding scientific question regarding cis-DCE and VC biodegradation, Mr. Evan Cox (center), Dr. James Gossett (right of center), and Dr. James Spain (left of center) were selected to receive the SERDP Environmental Restoration Project-of-the-Year Award. This new knowledge will enable DoD to improve management of chlorinated solvent-contaminated sites. Joining them here are Dr. Jeffrey Marqusee, SERDP and ESTCP Executive Director, and Dr. Anne Andrews, SERDP and ESTCP Deputy Director.

These researchers succeeded in identifying the organisms and elucidating the pathways by which these toxic chemicals may continue to break down at these sites. Through a series of elegant experiments, they determined that micropockets of oxygen, at very low concentration, do in fact exist in the subsurface at sites that appear to be anaerobic, thus resolving this longstanding scientific question.

This knowledge will directly reduce DoD costs for cleaning up chlorinated solvent sites and improve management of these sites. Managers will now be able to predict with confidence if a site will continue to remediate itself or if they need to introduce other processes to fully degrade these toxic chemicals.

Weapons Systems and Platforms, SERDP Project of the Year

Eliminating Chromium from Medium Caliber Gun Barrels

Mr. Mark Miller (U.S. Army Benet Laboratories) and his colleagues developed a method for gun manufacturing that eliminates a hazardous workplace risk, reduces costs, and improves weapons performance.

Medium caliber gun barrels, such as those mounted on trucks and helicopters, have historically been made using chromium as a coating on the interior bore surfaces. This hard surface protects against propellant gases and wear and tear from projectiles when the gun is fired. Although the coating provides the desired prop-

erties, the hexavalent chromium used in the plating process is a known carcinogen, requiring time-consuming and expensive precautions that protect workers, as well as incurring substantial disposal costs.

Mr. Miller and his team developed a new method for applying an environmentally benign tantalum-tungsten coating onto the interior surfaces of the gun barrels using an innovative explosive bonding process. Their work combined fundamental engineering, high-end computational modeling, and experimental research.

In addition to eliminating hazardous workplace exposure to hexavalent chromium and reducing costs, this new coating has the potential to enhance the military mission. Tests show that the tantalum-tungsten-lined gun barrels last three times as long as the chrome-plated tubes. This increased performance provides the basis for the development of more effective weapons in the future.

Resource Conservation and Climate Change, SERDP Project of the Year

Predicting Responses to Habitat Fragmentation, Restoration, and Management

Dr. Thomas Sisk (Northern Arizona University) and Dr. Leslie Ries (University of Maryland, College Park) together with their colleagues developed a modeling tool for DoD installation managers to manage land use and habitats in a way that improves both mission sustainability and conservation planning.



SERDP's Weapons Systems and Platforms Project of the Year, led by Mr. Mark Miller, developed a method for applying an environmentally benign tantalum-tungsten coating onto the interior surfaces of medium caliber gun barrels. Gun barrels coated with tantalum-tungsten last three times as long as barrels coated with hazardous hexavalent chromium.

installations are critical to that mission. DoD has a responsibility to the nation to preserve the species that reside on the land-scape and a responsibility to sustain it for military training.

These military installations often include a range of landscapes, from patches of pristing forget.

Military installations serve as the platform for meeting the Department's national security mission. The natural resources on these

These military installations often include a range of landscapes, from patches of pristine forest, to open fields, to parcels of lands heavily impacted by use. How birds and other animals interact

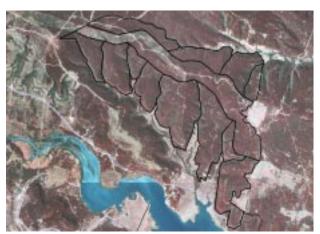
with these landscapes depends not only on the type of landscape and its size but also on its configuration—on the areas where these varied landscapes connect or the "edges."

Dr. Sisk and Dr. Ries applied a fundamental understanding of different animals' response to edges to develop a practical and user-friendly approach to managing multiple species on varied landscapes within a military site. The resulting tool combines a landscape model that links field and remotely sensed data to assess impacts of land use strategies on animal populations and an ecologically based multispecies modeling approach to threatened, endangered, and at-risk species management.



SERDP's Weapons Systems and Platforms Project-of-the-Year Award recipient Mr. Mark Miller (center left) and his team were joined by Dr. Jeffrey Marqusee (far right), SERDP and ESTCP Executive Director, and Dr. Anne Andrews, SERDP and ESTCP Deputy Director, at their poster highlighting a novel approach to eliminating chromium from medium caliber gun barrels.

Craig Kellstrom



SERDP's Resource Conservation and Climate Change Project of the Year, led by Dr. Thomas Sisk and Dr. Leslie Ries, developed a modeling tool that predicts responses to landscape changes and, in so doing, informs land use and habitat management decisions at military installations, improving both mission sustainability and conservation planning.



Dr. Leslie Ries and Dr. Thomas Sisk, recipients of the SERDP Resource Conservation and Climate Change Project-of-the-Year Award, showcased their research on different animals' response to areas where varied landscapes connect and development of a practical and user-friendly approach to managing multiple species within a military site. Craig Kellstrom

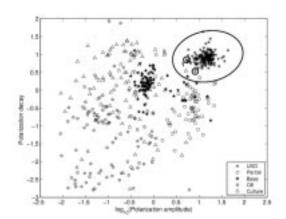
This tool enables researchers and land managers to determine the effects of habitat fragmentation, restoration, and management practices on multiple species and to translate that understanding to planning and on-theground management.

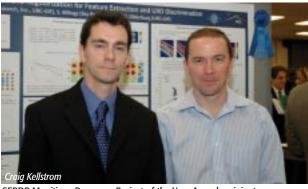
Munitions Response, SERDP Project of the Year

Robust Statistics and Modeling for Feature Extraction and UXO Discrimination

Dr. Stephen Billings (Sky Research, Inc. and University of British Columbia) and colleagues developed robust statistical methods and modeling techniques for improving unexploded ordnance (UXO) classification and discrimination.

DoD's liability for munitions response is estimated in the tens of billions of dollars. With resources constrained, munitions response actions on many sites are forecast to be decades out. One of the most promising technology advances for reducing the cost per site and accelerating the pace of cleanup is in the use of classification to distinguish the buried UXO from the vast quantity of harmless





SERDP Munitions Response Project-of-the-Year Award recipient Dr. Stephen Billings (right) and team member Dr. Laurens Beran presented their robust statistical methods and modeling techniques that significantly improve efforts to distinguish UXO from harmless metal objects.

pieces of metal found on any site, allowing resources to be directed to real risk reduction.

Key to UXO classification is the ability to fit geophysical data to a model that accurately represents parameters of a physical object. Such parameters include the object's length and shape and the material it is made of. Complicating the task are real-world factors, such as surveying over uneven ground, that affect the quality of data that can be collected in the field.

Dr. Billings and his team combined fundamental understanding of the underlying physics with their experience in the practicalities of gathering field data to develop robust statistical methods and modeling techniques that will improve parameter estimates and ultimately provide DoD with significant improvements in its ability to distinguish between UXO and harmless metal objects.

ESTCP Project of the Year

Composites with Low Hazardous Air Pollutant Compounds for Military Platforms

Dr. John La Scala (U.S. Army Research Laboratory) and his colleagues demonstrated and validated the use of more environmentally benign composite materials for high-performance military applications.

The military is rapidly moving to more and more advanced composite materials that offer great advantages over traditional materials such as steel. But as these new lightweight and high-performance composite structures are exploited for military applications, the environmental consequences associated with their applications need to be reduced. Current liquid resins are a significant source of hazardous air pollutant (HAP) emissions. As a result, extensive and costly measures are required to protect workers from being exposed to these harmful chemicals.

Dr. La Scala and his team demonstrated and validated low-HAP resins for the manufacture and repair of composite components used in military applications. These components include ballistic hardtops for the Marine Corps Humvees, hoods for Army vehicles, and an F-22 canopy cover for the Air Force.

Their work has shown that these resin formulations meet the critical military requirements and that the green low-HAP composites have improved weatherability and durability relative to the baseline composites. These composites will significantly decrease worker exposure



As demonstrated by a 2010 ESTCP Project of the Year, low-HAP resins for the manufacture and repair of composite components significantly decrease worker exposure, while meeting critical military requirements. Components demonstrated by Dr. John La Scala and his team include ballistic hardtops for the Marine Corps Humvees, hoods for Army vehicles, and an F-22 canopy cover for the Air Force shown here.

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ESTCP Project-of-the-Year Award recipient Dr. Mark Prouty (left) and his team developed and commercialized MetalMapper, a sensor built specifically for munitions classification. Deployment of MetalMapper can dramatically improve and accelerate DoD's ability to effectively remediate former military sites across the nation.

during manufacturing and minimize the expense and time associated with managing permits and air pollution recovery units.

ESTCP Project of the Year

MetalMapper

Dr. Mark Prouty (Geometrics) and his team developed and commercialized MetalMapper, a time-domain electromagnetic system that transmits and receives on multiple axes to provide a much richer data set that can be exploited for UXO classification.

Commercially available geophysical sensors that are generally used for munitions response were developed for other applications. They offer only a limited amount of information that can be used for classification to distinguish buried UXO from harmless pieces of metal found on a site.

In MetalMapper, Dr. Prouty and his team developed a purpose-built sensor for munitions classification. The technology builds on many years of combined efforts of scientists in university, government, and industry laboratories conducting the fundamental research that provided the basis for the sensor system.

MetalMapper is now being demonstrated at former military sites across the nation in collaboration with state and federal regulators. The deployment of MetalMapper can dramatically improve and accelerate DoD's ability to effectively remediate former military sites, reducing risks to the people who use and live on these sites and enabling redevelopment of these lands.

Symposium Presentations & Webcasts Available

Additional information about the 2010 symposium, including plenary and technical session presentations and short course webcasts, as well as preliminary information about the 2011 event to be held 29 November—1 December 2011, in Washington, D.C., is available at www.serdpestcp.org/symposium. The Call for Poster Abstracts will be posted at the end of May 2011.

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regulatory corner

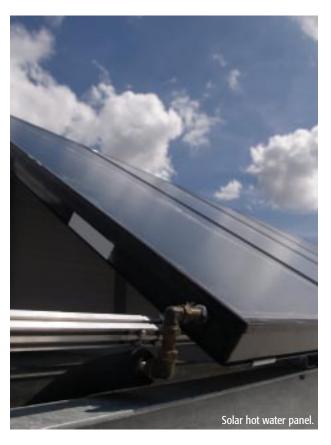
Developments of Interest: October 2010 through January 2011

THIS ARTICLE HIGHLIGHTS significant environmental regulatory changes and indicators suggesting future changes to the regulatory landscape.

Revolutionary changes in management of energy and environment in federal buildings and facilities are expected to happen in the near future. The Energy Independence and Security Act of 2007, the Federal Buildings Personnel Training Act of 2010, the Telework Enhancement Act of 2010, and the FY 2011 National Defense Authorization Act requirements include, but are not limited to the following:

Newly constructed or renovated facilities must meet the following requirements:

- New facilities must achieve stepwise reductions beginning in 2011 in the amount of fossil energy used by each new or renovated building, with the ultimate goal of zero fossil energy use by 2030.
- The use of solar hot water in these facilities must meet at least 30 percent of the hot water demand.
- These facilities must minimize indoor air pollutants from construction materials.
- Facility managers must commission building Heating,
 Ventilation and Air Conditioning systems that attend to efficient maintenance and operation



Department of Defense (DoD) facility repairs and renovations, and new construction must consider and use renewable energy and energy efficient products including items such as "hybrid vehicle plug-in charging stations."

Revolutionary changes in management of energy and environment in federal buildings and facilities are expected to happen in the near future.

All existing facilities must meet the following requirements:

- All existing facilities must be metered (for electricity by October 2012, and natural gas and steam by October 2016).
- Energy managers must be assigned.
- Energy managers must demonstrate core competencies by registration or certification (details to be outlined by the General Services Administration by July 2012).

All agencies must meet the following requirements:

- Establish a policy on Telework, and determine the eligibility for each agency employee to participate in telework (by July 2011).
- DoD will annually update the DoD Energy Performance Master Plan and coordinate it with annual budget submissions.

Meeting the zero fossil energy use goal will almost certainly stimulate significant changes in building design



and operation in addition to the use of renewable energy. These goals will likely be supplemented in years to come by even more ambitious energy conservation goals so that many buildings become not only fossil fuel neutral but net energy neutral.

Additional regulatory and environmental news items of interest (October 2010 through January 2011) include the following:

EPA Comments to Final Environmental Impact Statement and Draft Supplemental Environmental Impact Statement of F-35 Fighter East Coast Basing; Marine Corps Air Stations & Eglin Air Force Base (30 November 2010) http://yosemite.epa.gov/oeca/webeis.nsf/viEIS04LA?OpenView

Final Council on Environmental Quality (CEQ) Guidance for Establishing, Applying, and Revising NEPA Categorical Exclusions (06 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-30017.pdf

Meeting the zero fossil energy use goal will almost certainly stimulate significant changes in building design and operation in addition to the use of renewable energy.

Air

National Emission Standards for Hazardous Air Pollutants Emissions; Hard Decorative Chromium Electroplating & Chromium Anodizing Tanks (21 October 2010) http://edocket.access.gpo.gov/2010/pdf/2010-23839.pdf

Protection of Stratospheric Ozone: Amendments to the Section 608 Leak Repair Requirements (15 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-31337.pdf

Drinking Water

Reduction of Lead in Drinking Water Act—Defines Lead Free Fittings and Fixtures (04 January 2011) http://www.gpo.gov/fdsys/pkg/BILLS-111s3874enr/pdf/ BILLS-111s3874enr.pdf

Chromium-6 Reported at Potential Levels of Concern Reported Widely Present in Drinking Water—Press Release from Non-governmental Organization Environmental Working Group (23 December 2010) http://static.ewg.org/reports/2010/chrome6/html/home.html

National Environmental Policy Act (NEPA)

U.S. Environmental Protection Agency (EPA) Comments to United States Marine Corps F-35B West Coast Basing Environmental Impact Statement (22 November 2010)

http://yosemite.epa.gov/oeca/webeis.nsf/(PDFView)/20100417/ \$file/20100417.PDF?OpenElement

Occupational Safety and Health Act (OSHA)

Occupational Exposure to Carbon Nanotubes and Nanofibers—Recommendations for Safe Handling (30 November 2010)

http://www.cdc.gov/niosh/docket/review/docket161A/ default.html

OSHA Administrative or Engineering Controls of Occupational Noise—"Feasibility" Not to be Based on Cost (19 October 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-26135.pdf

OSHA Cranes and Derricks in Construction Standard— Recordkeeping Requirements (08 November 2010) http://edocket.access.gpo.gov/2010/pdf/2010-27947.pdf

Greenhouse Gasses, Climate Change & Energy

Fossil Fuel-Generated Energy Consumption Reduction for New Federal Buildings and Major Renovations (15 October 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-25852.pdf

Department of Energy Draft Guidance on Management of Energy and Water Efficiency in Federal Buildings (15 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-31467.pdf

Federal Buildings Personnel Training Act of 2010 (14 December 2010)

http://www.gpo.gov/fdsys/pkg/BILLS-111s3250enr/pdf/ BILLS-111s3250enr.pdf



Fiscal Year 2011 Defense Authorization Act (07 January 2011) (Contains various environmental and energy provisions)

http://www.gpo.gov/fdsys/pkg/BILLS-111hr6523enr/pdf/ BILLS-111hr6523enr.pdf

Ocean Acidification—Guidance to States on Listing Impaired Waters (15 November 2010)

http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/oa_ memo_nov2010.cfm

EPA Mandatory Greenhouse Gas Reporting—Date Deferral for Emission Equation Input Data Elements (27 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-32450.pdf

CEQ Recommended Actions in Support of a National Climate Change Adaptation Strategy (14 October 2010) http://www.whitehouse.gov/administration/eop/ceq/

Procurement

initiatives/adaptation

Final (Round 6) Designation of Biobased Items for Federal Procurement (18 October 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-26122.pdf

Designation of Proposed (Round 7) Biobased Items for Federal Procurement (23 November 2010) http://edocket.access.gpo.gov/2010/pdf/2010-29191.pdf

EPA Green Purchasing Guides Available (16 December 2010) http://www.epa.gov/epp/pubs/greenguides.htm

Direct Final Rule Staying Numeric Stormwater Turbidity Limitation for the Construction and Development Point Source Category (05 November 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-28033.pdf

Other

Spill Prevention Control and Countermeasures Plans Final Rule; Compliance Date Postponed to 10 November 2011 (14 October 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-25899.pdf

Compatibility of Underground Storage Tank Systems With Biofuel Blends (17 November 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-28968.pdf

Telework Enhancement Act of 2010 (09 December 2010) http://www.gpo.gov/fdsys/pkg/BILLS-111 hr1722enr/pdf/ BILLS-111 hr 1722 enr.pdf

Economic Case Against Disposing U.S. Naval Vessels at Sea (report from nonprofit Basel Action Network) (13 December 2010)

http://www.ban.org/ban_news/2010/101213_huge_bill_and_ lost_jobs.html

Next Generation Risk Assessment Public Dialogue (30 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-32977.pdf

Web-Distributed Labeling for Pesticides—Request for Comments (29 December 2010)

http://edocket.access.gpo.gov/2010/pdf/2010-32036.pdf

To subscribe or unsubscribe, contact NFESCRegulatorySupportDesk@navy.mil or 805-982-2640.

Water & Stormwater

Federal Facility Responsibility to Contribute to Payment for State or Local Stormwater Programs (Public Law) (04 January 2011)

http://www.gpo.gov/fdsys/pkg/BILLS-111s3481enr/pdf/ BILLS-111s3481enr.pdf

Total Maximum Daily Load for the Chesapeake Bay (05 January 2011)

http://edocket.access.gpo.gov/2011/pdf/2010-33280.pdf

The Naval Facilities Engineering Service Center provides a free Weekly Federal Regulatory Summary that DoD personnel or contractors supporting DoD may receive by e-mail. To subscribe or unsubscribe, contact NFESCRegulatorySupportDesk@navy.mil or 805-982-2640.

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NAVICP & USMC Develop Green **Procurement Guide**

Resource Now Available to Help Activities Improve Their Practices

THE NAVAL INVENTORY Control Point (NAVICP) in concert with the United States Marine Corps (USMC) has developed a comprehensive Green Procurement Program (GPP) guide that should be used by all activities to improve their procurement practices. This guide can help field activities develop a robust GPP and make green procurement a way of life. All personnel are responsible for implementing the Department of the Navy (DON) GPP including requirements developers, contracting officers, and Government Commercial Purchase Card (GCPC) holders. GPP applies to everything from construction contracts, to service contracts, to commodity purchase, to items purchased from activity/installation supply stores and to all other micro-purchases.

Background

Green procurement is nothing new. Everyday more and more companies are offering products that have "green" characteristics, are environmentally friendly, and are safer to use. What is new is the commitment of the federal government to maximize the amount of products it

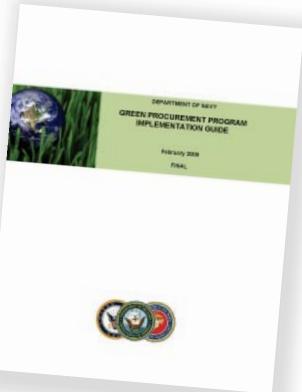
purchases that have these designations. The latest policy, executive order, and guidance documents are all being revised to include significant portions of language that address the growing desire and need of the federal government to become a leader in sustainable innovation and purchasing practices.

The Navy has taken a particularly strong stance on this issue with regard to energy. Energy efficiency is paramount to the future success and security of our military establishment. The Honorable Ray Mabus, Secretary of the Navy, has created an ambitious list of goals associated with energy usage that cannot be met without a significant focus on green procurement.

Green Procurement Breakdown

The GPP guide is meant to provide advice about establishing a GP team to ensure that your activity is doing its best to go

green. The key members of this team represent Environmental Management, Contracting, Public Works/Facilities Maintenance Office, and Operations. The team may also include an activity/installation Energy Manager; transportation personnel who are responsible for purchasing vehicles and fuels; and an activity/installation Pollution Prevention program manager. It is



recommended to include the Public Affairs and Legal Offices to provide additional support to the team.

Typical responsibilities for the different organizations at an activity/installation level can be as follows:

Contracting Officers

Ensure the use of the appropriate acquisition clauses, addressing energy and water efficiency, alternative fuels and fuel efficiency, biobased product acquisition, non-Ozone Depleting Substances (ODS) and Environmentally Preferable Products (EPP).

Activity/Installation GCPC Managers

Ensures that all cardholders and approving officials receive training that includes GPP requirements.

Project Managers are responsible for specifying green products to be included in all service contracts and construction projects whether they are inhouse or contracted out.

Environmental Management Offices

Provide technical guidance, explaining the program requirements and helping buyers to identify green products.

Energy Manager

Guides the GPP team in setting and achieving energy-related targets.

Transportation Offices

Manage the Alternative Fuel Vehicle and alternative fuel program element of the GPP.

Legal Offices

Support the GPP team by reviewing program activities.

Public Affairs Offices
 Support GPP by
 promoting the
 program to the
 activity/installation
 populace.

In addition to outlining green team recommendations, the GPP guide also offers guidance in identifying green product categories as there are many ways that products can be green. It is often confusing and difficult to try and identify which characteristics are the most beneficial when so much variation exists. The GPP guide addresses this issue and has identified six specific categories

of green products that are most applicable to Navy acquisition and requirements.

In order to make it easier to identify these products, the Defense Logistics Agency (DLA) and the General Services Administration (GSA) have developed a series of symbols that are included in their purchasing catalogs and online ordering systems to allow a rapid identification of environmentally friendly attributes. The table on the following pages further details these categories. It should be noted that DoD EMALL and GSA Advantage apply different symbols to each of their environmental products.

When accessing the DoD EMALL (https://emall6.prod.dodonline.net) a green tree symbol appears beside all GP products, along with two capital letters that designate a specific environmental attribute code (ENAC).

Navy Energy Goals

SECRETARY RAY MABUS announced the following goals for DON in October 2009:

- Change the way the Navy and Marine Corps awards contracts. The lifetime energy cost of a building or a system, and the fully burdened cost of fuel in powering those, will be a mandatory evaluation factor used when awarding contracts.
- By 2012, demonstrate in local operations a Green Strike Group composed of nuclear vessels and ships powered by biofuel, and deploy it by 2016.
- By 2015, reduce petroleum use in DON's 50,000 strong commercial fleet in half.
- By 2020, produce at least half of DON's shore-based energy requirements from alternative sources.
- By 2020, half of DON's total energy consumption for ships, aircraft, tanks, vehicles and shore installations will come from alternative sources.

The ENAC defines the category to which it applies. For example, the designation "[EB]" designates the environmental product Re-refined Lubricating Oil. When accessing GSA Advantage (https://www. gsaadvantage.gov), each GP category is represented by a different symbol





and does not list an ENAC. For example, recovered materials products are represented by a three-arrow recycling symbol.

Green Product Categories

THE FOLLOWING TABLE provides the DoD and GSA symbols to look for as well as some insights into the products most common to each of the six categories of green products.

CATEGORY	DOD SYMBOL	GSA SYMBOL	COMMON PRODUCTS
Recovered Material	+ ENAC	CPG 😂	 Copier and printer paper Recycled toner cartridges Plastic outdoor lumber Re-refined lubricating oils and antifreeze Compost from yard and food waste Rebuilt automotive parts Retread tires Landscaping/playground products made from used tires
Energy Efficient	+ ENAC	FEMP	 Computer equipment Refrigerators and freezers Air conditioning units Fluorescent lamps Low-flow shower heads Low-flow toilets Clothes washers
Alternative Fuels/ Alternative Fueled Vehicles	+ ENAC	N/A	 Alternative Fuel Vehicles—dedicated, flexible fuel, or duel fuel vehicles Advanced Technology Vehicles—hybrid, electric vehicles Alternative fuels: Biodiesel (B20) Electricity Ethanol (E85) Ethanol (E100) Natural gas Propane
USDA Biobased Products	+ ENAC		 Hydraulic fluids, lubricants, greases, and oils Insulating foams Grease and adhesive removers Hand cleaners Carpets and carpet cleaners Biodegradable containers and cutlery Sorbents Composite panels Bedding, linens, and towels

DOD SYMBOL **GSA SYMBOL COMMON PRODUCTS** Non-Ozone Depleting Non-ODS Replacements for: **ENAC** Substances Refrigeration and air conditioning Cleaning solvents Aerosols Adhesives, coatings, and inks Fire suppression and explosion protection Sterilants Foaming blowing agents **Environmentally Preferable** Covers any environmentally friendly product not previously mentioned Ranges from "greening" your meetings to building design

Green procurement is everyone's responsibility. Being aware of the available tools and guidance will help to ensure that the Navy is successful in increasing the amount of green products and services it purchases.

Doing Your Part

While establishing a formal team is certainly a step in the right direction, full implementation of green procurement will not occur unless every single federal employee gets involved. Making the decision to buy green must become the norm rather than an added requirement. Everyone from the initiator to the end user should feel obligated to ensure that some level of consideration has been given to make certain the government is purchasing environmentally friendly products.

Green procurement is everyone's responsibility. Being aware of the available tools and guidance will help to ensure that the Navy is successful in increasing the amount of green products and services it purchases. Furthermore, acting as a leader will not only benefit the federal government but will also serve as an example to the rest of the commercial world in developing green purchasing preferences.

Download a copy of the GPP guide at http://www.p2sustainabilitylibrary.mil/p2_documents/don_gpp_implementationguide020509.pdf. For more information or a hardcopy of the guide, contact Trey Kunkel.

NAVICP is a field activity of the Naval Supply Systems Command (NAVSUP). NAVICP procures, manages, and supplies spare parts of naval aircraft, submarines and ships worldwide. NAVICP has two locations, one in the Lawncrest section of Northeast Philadelphia and the other in Mechanicsburg, PA. J

CONTACTS

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Jennifer Wilber United States Marine Corps 571-256-2810 jennifer.wilber@usmc.mil

New Munitions & Range Guidance Makes EPCRA 313 Reporting Easier

N45 Expands Guidance & Enhances Web Site to Support Reporting Efforts

THE CHIEF OF Naval Operations Energy and Environmental Readiness Division (CNO N45) has further expanded its "Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA): A Primer for Navy Facilities" (May 2009) guidance with a new section on munitions and range activities. "How to Consider Munitions and Range Activities Under EPCRA Section 313" provides detailed guidance on the following items:

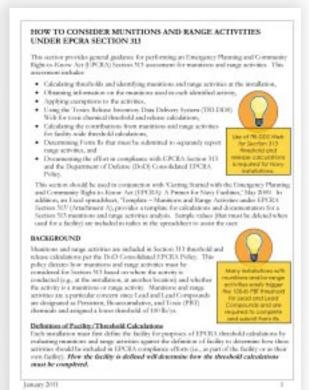
- Developing a list of all munitions and range activities in which installation personnel are involved.
- Examining the land on which the munitions and range activities occur to define facility and/or reporting responsibility under EPCRA Section 313.
- Examining the 10 full-time equivalent criterion under EPCRA Section 313, where appropriate.
- Differentiating between a munitions activity and range activity.
- Applying EPCRA Section 313 exemptions to the munitions and range activities.

- Collecting data and using the Toxics Release Inventory Data Delivery System (TRI-DDS) web site (TRI-DDS) Web) for threshold and release calculations.
- Calculating releases and submitting EPCRA Section 313
 Form R reports for munitions and range activities.

In addition, an Excel spreadsheet, "Template—Munitions and Ranges under EPCRA Section 313," included

with the expanded guidance, provides a template for calculations and documentation. Sample values (that must be deleted when used for an installation) are included in italics in the spreadsheet to assist the user.

To request a copy of "How to Consider Munitions and Range Activities Under EPCRA Section 313" and the accompanying calculation spreadsheet, contact Anita Firestine at Anita_firestine@urscorp.com or download an electronic version from TRI-DDS Web at https://dod-tridds.org/triweb/ (login required). In the near future, the document and spreadsheet files will be posted to the following sites:





- The Naval Facilities Engineering Command's Enterprise Document Library at https://portal.navfac.navy.mil/portal/page/portal/NAVFAC/NAVFAC_DOCS_PP
- The Naval Civil Engineer Corps Officer School web site at http://www.cecosweb.com/handouts/EPCRA

The next Calculation Manual in the "Getting Started with EPCRA" series will address calculations for nitrate compounds under EPCRA Section 313.

On 26 November 2010, U.S. Environmental Protection Agency (EPA) added 16 chemicals to the toxic chemical list. The additions are effective for calendar year 2011 (reports due on or before 1 July 2012). Four of the chemicals were added to the Polycyclic Aromatic Compound (PAC) category and the remaining 12 chemicals were added as specifically listed toxic chemicals.

■ The addition of the chemicals to the PAC toxic chemical category will impact Navy installation coincidental manufacture calculations. Any subsequent Form R release calculations will need to be modified to include the new PAC category members. However, very few Department of Defense (DoD) or Navy installations trigger reporting for PACs, and these

Navy EPCRA E-mail Helpline & Form R Review Service

NAVY INSTALLATIONS CAN get all their EPCRA questions answered through CNO N45's EPCRA E-mail Helpline (NavyEPCRA@urscorp.com). In addition, a free technical review service for Form R reports is also available through the Helpline. This review includes checking for calculation errors and reporting mistakes. Installations interested in utilizing the review service must send an e-mail to the Helpline identifying the technical contact and the Form Rs that will be sent for review by 15 May 2011. Access to EPA's Toxics Release Inventory-Made Easy Website (TRI-MEweb) must be granted to the helpline staff member to review the draft Form R. Navy installations are strongly encouraged to take advantage of the service by having a "second set of eyes" review their Form Rs.



New Enhancements to Range Release Calculation Resources

TRI-DDS WEB HAS been updated for calendar year 2011 efforts. Changes include an upgraded user interface and addition of composition data for over 900 new munitions items. These enhancements were designed to facilitate more efficient calculation of thresholds and releases for demilitarization and range activities. TRI-DDS Web employs

automatically applied exemptions, customized user guidance and assistance, and a variety of reports to meet reporting requirements and document compliance with EPCRA in accordance with EPA regulations and DoD and Navy policy. TRI-DDS Web is available to all DoD users and approved contractors at https://www.dod-tridds.org.



- additions are not likely to cause more installations to trigger reporting.
- The specifically listed chemicals added to the toxic chemical list are not common material components. (The most common may be vinyl chloride.) Material compositions will need to be reviewed to determine if and where these new toxic chemicals exist.
- These additions will require the modification of software systems (or other electronic tools) to identify the new PAC members and new chemicals as toxic chemicals to appear in necessary reports.

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